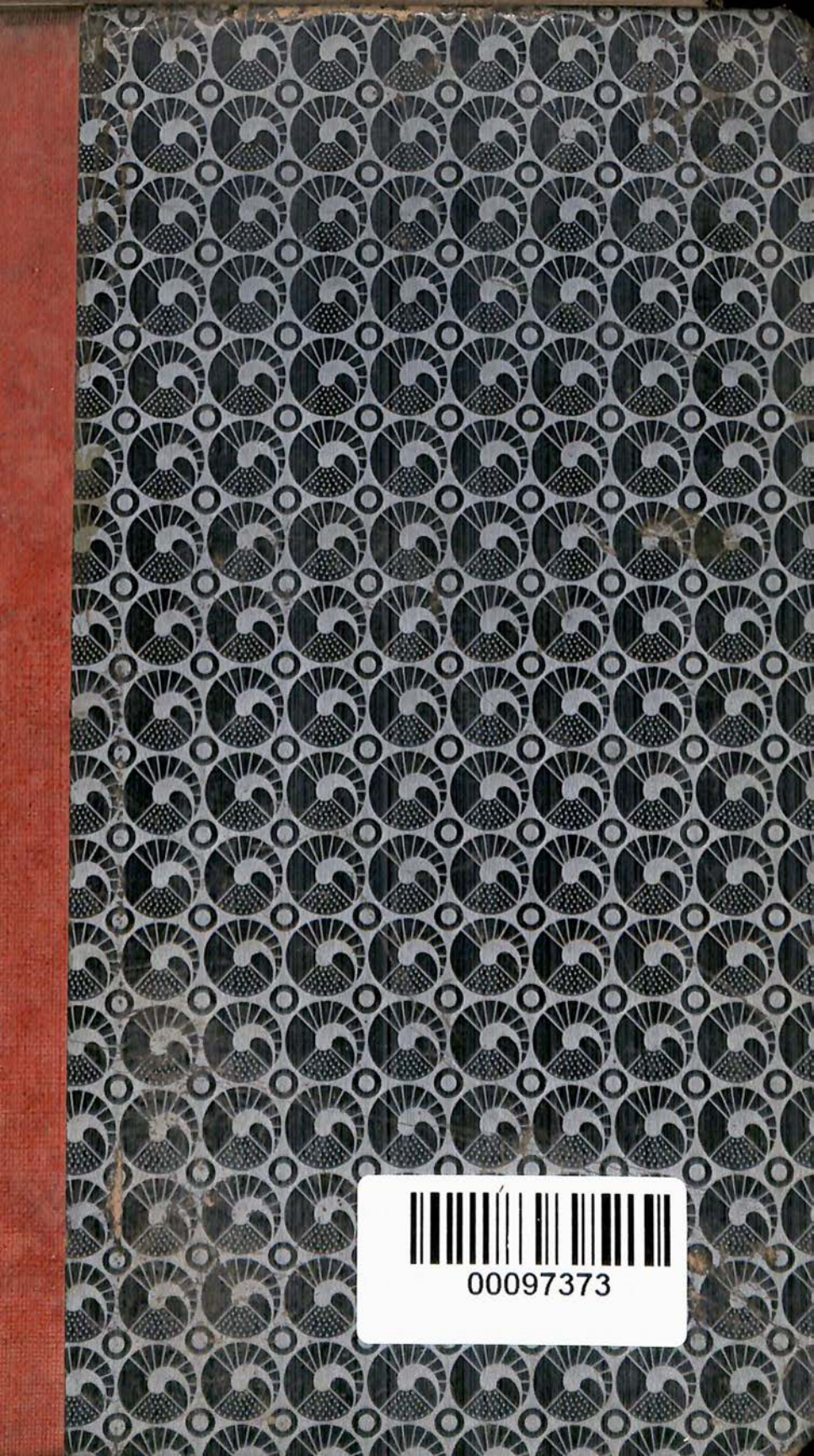
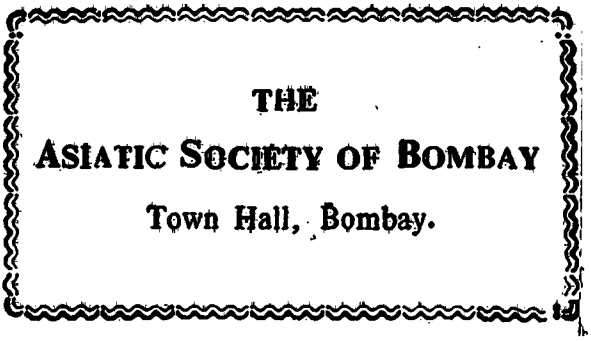

00097373



Digitized with financial assistance from the
Government of Maharashtra
on 26 June, 2018

CHIMPSEYAN CHIEF

Drawn by D. Wilson, A.D. from sketches by Paul Kane.

PREHISTORIC MAN

RESEARCHES INTO THE ORIGIN OF CIVILISATION IN THE OLD AND THE NEW WORLD

201 ...

BY

DANIEL WILSON, LL.D.

PROFESSOR OF HISTORY AND ENGLISH LITERATURE IN UNIVERSITY COLLEGE, TORONTO;
AUTHOR OF THE "ARCHÆOLOGY AND PREHISTORIC ANNALS OF SCOTLAND," ETC.

97373

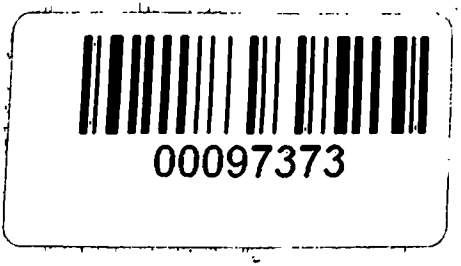
IN TWO VOLUMES.

VOLUME I.

Cambridge:
MACMILLAN AND CO.,
AND 23, HENRIETTA STREET, COVENT GARDEN,
London.
1862.

NN. b. 19

God
901'9
Wil/Pre
97373



IN FOND MEMORIAL

OF A BROTHER'S LIFE-LONG SYMPATHY

IN MANY FAVOURITE RESEARCHES

THESE VOLUMES

DEPRIVED BY DEATH OF THEIR PURPOSED DEDICATION

ARE INSCRIBED WITH THE LOVED NAME OF

GEORGE WILSON, M.D. F.R.S.E.

LATE REGIUS PROFESSOR OF TECHNOLOGY IN THE UNIVERSITY OF EDINBURGH
AND DIRECTOR OF THE INDUSTRIAL MUSEUM OF SCOTLAND.

PREFACE.

THE object aimed at in the following work is to view Man, as far as possible, unaffected by those modifying influences which accompany the development of nations and the maturity of a true historic period, in order thereby to ascertain the sources from whence such development and maturity proceed. These researches into the origin of civilisation have accordingly been pursued under the belief which influenced the author in previous inquiries, that the investigations of the archæologist, when carried on in an enlightened spirit, are replete with interest in relation to some of the most important problems of modern science. To confine our studies to mere antiquities is like reading by candle-light at noonday; but to reject the aid of archæology in the progress of science, and especially of ethnological science, is to extinguish the lamp of the student when most dependent on its borrowed rays. This is impressed on the mind with renewed force by the novel phases in which the problems affecting man's being are reproduced. We are no longer permitted to discuss merely the diversities of existing races. It seems as if the whole comprehensive question of man's origin must be reopened, and determined afresh in its relations to modern science. To the naturalist who turns from the study of inferior

orders of life, man civilized, or even brought into close contact with civilisation, seems an essentially artificial product of many extraneous influences: a being "from nature rising slow to art." Nor has the verdict of the philosopher invariably conflicted with the fancy of the poet, that man devoid of all civilisation is in a state of nature, and the true type of man primeval. Against such an idea, however, all the higher attributes of his nature seem to cry out. Tested by every moral standard he is found to have deteriorated far below his normal capacities, and "the noble savage" proves at last but a poet's dream.

But have we then no alternative between man *plus* the artificialities of civilisation, and man *minus* the influential operation of moral laws which have their efficient equivalents in the instincts of all other animals; or can we not realize even in theory an intermediate normal condition? Such questions are replete with interest whatever be the value of answers rendered here to some of the difficulties they suggest. The ethnologist does indeed study man from the same point of view as the mere naturalist; but to do so to any good purpose this essential difference between man and all other animals must be kept in view: that in him a being appears for the first time among the multitude of animated organizations, subject to natural laws as they are, but including within himself the power of interpreting and controlling the operation of those laws; of accumulating and transmitting experience; and, above all, of looking in upon the workings of his own mind, and recognising as part of his nature a system of moral government which he may

obey or resist, though not with impunity. Our aim, therefore, is to isolate him from extraneous influences, and look, if possible, on man *per se;* or at least where he can be shown to have attained maturity, exposed only to such influences as are the offspring of his own progress. In so far as this is possible may we hope to recover some means of testing man's innate capacity, and of determining by comparison what is common to the race."

Where, then, is man to be thus found? In the days of Herodotus, Transalpine Europe was a greater mystery to the nations on the shores of the Mediterranean than Central Africa is to us. To the Romans of four centuries later, Britain was still almost another world; and the great northern hive from whence the spoilers of the dismembered empire of the Cæsars were speedily to emerge, was so entirely unknown to them, that, as Dr. Arnold has remarked in his inaugural lecture: "The Roman colonies along the banks of the Rhine and the Danube looked out on the country beyond those rivers as we look up at the stars, and actually see with our eyes a world of which we know nothing." Nevertheless, the civilisation of the historic centres of the ancient world around the Mediterranean was not without some influence on the germs of modern nations, then nursing the hardihood of a vigorous infancy beyond the Danube and the Baltic. The shores of the Atlantic and German oceans, and the islands of the British seas, had long before yielded tribute to the Phœnician mariner; and as the archæologist and the ethnologist pursue their researches, and restore to light memorials of Europe's infancy and early youth, they are more frequently startled

with affinities to the ancient historic nations, in language, arts, and rites, than by the recovery of evidence of a wholly unfamiliar past.

But it is altogether different with the New World which Columbus revealed. Superficial students of its monuments have indeed misinterpreted intellectual characteristics pertaining to the infantile instincts common to human thought into fancied analogies with the arts of Egypt; and more than one ingenious philosopher has traced out affinities with the mythology and astronomical science of the ancient East: but the western continent still stands a world apart, with a peculiar people, and with languages, arts, and customs essentially its own. To whatever source the American nations may be traced, they had remained shut in for unnumbered centuries by ocean barriers from all the influences of the historic hemisphere. Yet there the first European explorers found man so little dissimilar to all with which they were already familiar, that the name of Indian originated in the belief, retained by the great cosmographer to the last, that the American continent was no new world, but only the eastern confines of Asia.

Such, then, is a continent where man may be studied under circumstances which seem to furnish the best guarantee of his independent development. No reflex light of Grecian or Roman civilisation has guided him on his way. The great sources of religious and moral suasion which have given form to mediæval and modern Europe, and so largely influenced the polity and culture of Asia, and even of Africa, were effectually excluded; and however prolonged the period of occupation of the western hemisphere by its own American nations may

have been, man is still seen there in a condition which seems to reproduce some of the most familiar phases ascribed to the infancy of the unhistoric world. The records of its childhood are not obscured, as in Europe, by later chroniclings; where, in every attempt to decipher the traces of an earlier history, we have to spell out a nearly obliterated palimpsest. Amid the simplicity of its palæography, the aphorism, by which alone the Roman could claim to be among the world's ancient races, acquires a new force: "antiquitas seculi, juventus mundi." The revolutions of modern history, and the frequent intercourse of the nineteenth century, have indeed conjoined the western continent to ancient Christendom; and attracted attention to it most frequently as an arena whereon old political systems and religious theories are reproduced and tested anew by nations of European descent. But in the sixteenth century the absolute isolation of this "world apart" was strongly felt. Sir Thomas More was already in the household of Cardinal Morton, to which he was admitted in 1495, when the first rumours of the discovery of America reached his ears; and within twenty years thereafter he produced his platonic commonwealth of Utopia, an imaginary island visited by Raphael Hythloday, a companion, as he feigned, of Amerigo Vespucci, from whom the wondrous narrative was derived during a visit to Antwerp. Another century had nearly completed its cycle since the eye of Columbus beheld the long-expected land, when in 1590, Edmund Spenser crossed the Irish Channel, bearing with him the first three books of the "*Faërie Queen*," in the introduction to the second of which he thus defends the verisimili-

tude of the fairy-land in which the scenes of his "famous antique history" are laid :—

"Who ever heard of th' Indian Peru?
Or who in venturous vessel measured
The Amazon huge river, now found true?
Or fruitfullest Virginia who did ever view?

Yet all these were, when no man did them know,
Yet have from wisest ages hidden been;
And later times things more unknown shall show;
Why then should witless man so much misween
That nothing is but that which he hath seen?
What if within the moon's fair shining sphere;
What if in every other star unseen,
Of other worlds he happily should hear?
He wonder would much more; yet such to some appear."

It was by the advice of Raleigh, his "shepherd of the ocean," that the poet visited England with the unpublished poem; yet it is obvious that to his fancy the western hemisphere was still almost as much a world apart, as if the discoverers of Virginia had sailed up the blue vault of heaven, and brought back the story of another planet on which it had been their fortune to alight.

Here then appears to be a point from whence it seems possible to obtain, as it were, a parallax of man, already viewed in Europe's prehistoric dawn; to look on him as on the stars seen from Teneriffe above the clouds; and to test anew what essentially pertains to him, and what has been artificially, or even accidentally superadded by external circumstances. Such, at least, has been the author's aim in turning to account the opportunities afforded by a prolonged residence on some of the newest sites of the New World; and to the

use made of these must be mainly due whatever value pertains to the glimpses of a remote past which the following pages attempt to disclose. But though thus far dependent on American researches, they refer no less to the origin of man and the beginnings of his history in the Old World than in the New. The author had already familiarized himself with the unwritten chronicles of Europe's infancy and youth, when unexpectedly transplanted among the colonists of another continent, and within reach of aboriginal tribes of the American forests. "The eye sees what it brings the power to see;" and in these he discovered objects of interest on many grounds, but chiefly from the fact that he soon perceived he had already realized much in relation to a long obliterated past of Britain's and Europe's infancy, which was here reproduced in living reality before his eyes. In 1853, he received the appointment to the chair of History and English literature in University College, Toronto, and before the year drew to a close had commenced observations, the results of which are embodied in these volumes. Whatever may be their worth, they set forth the fruits of patient and conscientious investigation, and concentrate into brief space deductions arrived at after much labour and research. His vacations have afforded opportunities for witnessing the Red Man as he is still to be seen beyond the outskirts of modern civilisation, and for exploring the buried memorials of extinct nations on older sites. He has also twice visited Philadelphia, and minutely studied the collections formed by the author of the *Crania Americana*, with the additions made to that valuable ethnological department of the Academy of Natural

Sciences. Repeated references in the following pages indicate other American collections in Washington, Philadelphia, Boston, New York, Albany, etc., as well as those of Canada, which have also furnished useful materials.

. In carrying out his researches, the author has been placed under many obligations to scientific friends. To Dr. Henry, the learned Secretary of the Smithsonian Institution at Washington; Dr. J. Aitken Meigs, the Librarian of the Academy of Natural Sciences of Philadelphia; Dr. J. C. White, the Secretary of the Boston Natural History Society; Mr. Thomas Fenwick and Dr. E. H. Davis of the American Ethnological Society; and the Hon. George Folsom of the Historical Society of New York: he is specially indebted for the liberality with which Museums and Libraries have been placed at his command. On two different visits to Philadelphia to examine the Collection of Crania formed by Dr. Morton, the keys of the cases were freely intrusted to him, and some of the many liberal services rendered in furtherance of his investigations by their experienced curator, Dr. J. Aitken Meigs, are acknowledged in the following pages. With equally unrestricted freedom, the collections of the Historical Society of New York, and the cabinets of the Natural History Society of Boston, as well as the private collections of Dr. J. Mason Warren, Mr. J. H. Blake, Dr. E. H. Davis, and others referred to, were thrown open to him; and repeated experience confirms him in the belief, that in no country in the world are public and private libraries and collections made available to the scientific inquirer with the same unrestricted freedom as in the United States. To J. H. Blake, Esq. of Boston, the author is specially indebted

for the liberality with which he has placed at his disposal notes of travel in Peru; drawings of objects observed there; and the valuable collection of mummies, crania, and Peruvian antiquities brought home by him, and repeatedly referred to in the following pages. To Dr. E. H. Davis, one of the authors of the *Ancient Monuments of the Mississippi Valley*, he is under great obligations, not only for access to the collections from which the illustrations of that work were derived, but for casts and photographs of special objects calculated to aid him in his researches. Among his Canadian friends, he owes special thanks to his colleague, Professor Croft, for carefully executed analyses of Peruvian bronzes; to Dr. Bovell and Dr. Hodder, for free use of their collections of Indian crania; to Mr. Paul Kane, the author of *Wanderings of an Artist among the Indians of North America*, for sketches made during his travels, as well as for information derived from recollections of the incidents and observations of a highly-privileged sojourner among the Indian tribes of the Hudson's Bay territory; and to the Hon. G. W. Allan, whose ethnological collections now include the numerous objects obtained by Mr. Kane during his wanderings. Older friends at home, and especially Mr. T. B. Johnston, the Treasurer of the Society of Antiquaries of Scotland, and Mr. Robert Cox, W.S., of the Edinburgh Phrenological Society, have largely aided in renewed references to the familiar collections of those Societies.

To the sympathy manifested in the author's researches by his Excellency Sir Edmund W. Head, Bart., while Governor-General of the Province, he is indebted for instructions forwarded to the various officers and super-

intendents of the Indian Department, whereby he has been able to obtain valuable statistics illustrating questions which affect the present condition and future prospects of the Indians of British North America, and which are discussed here in their relations to the main subject of investigation.

It only remains to be added, that while the facilities for research into the origin of civilisation and the condition of primitive races, afforded by a residence in the New World, are great, they are accompanied by one important drawback, in the want of adequate libraries or books of reference, inevitable in a young colony. As, moreover, the author has been prevented, by the impediments which the Atlantic interposes between him and his publishers from revising the proof-sheets of the following pages, he must crave the intelligent forbearance of the critic should any notable blunders escape the eye of the press-reader; and if, as may not improbably prove to be the case, some of his observations have been anticipated or disproved in recent publications, or even by the mere lapse of time, it may be added that the MS. was in the hands of the publishers in January 1861, and the subsequent delay in the publication of these volumes has originated in causes lying beyond his control.

UNIVERSITY COLLEGE, TORONTO,
12th March 1862.

CONTENTS.

CHAPTER I.

INTRODUCTION, ... PAGE 1

CHAPTER II.

THE OLD WORLD AND THE NEW, ... 17

CHAPTER III.

THE PRIMEVAL OCCUPATION: SPEECH, ... 44

CHAPTER IV.

THE PRIMEVAL TRANSITION: INSTINCT, ... 86

CHAPTER V.

THE PROMETHEAN INSTINCT: FIRE, ... 119

CHAPTER VI.

THE MARITIME INSTINCT: THE CANOE, ... 140

CHAPTER VII.

THE TECHNOLOGICAL INSTINCT: TOOLS, ... 178

CHAPTER VIII.

THE METALLURGIC INSTINCT: COPPER, ... 231

CHAPTER IX.

THE METALLURGIC ARTS: ALLOYS, ... 280

CHAPTER X.

PAGE

THE ARCHITECTURAL INSTINCT: EARTHWORKS, . . 315

CHAPTER XI.

THE HEREAFTER: SEPULCHRAL MOUNDS, ... 350

CHAPTER XII.

PROPITIATION: SACRIFICIAL MOUNDS, ... 370

CHAPTER XIII.

COMMEMORATION: SYMBOLIC MOUNDS, ... 386

CHAPTER XIV.

PROGRESS: NATIVE CIVILISATION, ... 408

CHAPTER XV.

THE ARTISTIC INSTINCT: IMITATION, ... 449

PREHISTORIC MAN.

CHAPTER I.

INTRODUCTION.

In the history of modern ages the important results which have sprung from men merely changing their place of habitation are not the least remarkable. The European transferred to America looked on all things from a new point of view; and though he could not divest himself at once, or entirely, of the traditional habits and thoughts of the father-land, yet Europe begins to recognise the value of some great social truths discovered by the free outlook which that new world afforded. But there are other sciences besides those of political and social economy which may gain an accession of many important truths by the wise use of that same free outlook; and none more so than that new science which makes man its subject, and searches earnestly into the secret truths of his nature, the history of his infancy and youth, and the true attributes of his full development. In the forests and on the prairies of America we see the free savage in what it has been customary to call a state of nature. We witness the same free savage brought into contact with some of the highest phases of European civilisation; while the inheritor of that same civilisation,

divested of its inevitable control, has been left amid the widening inheritance of his new clearings to develop whatever tendencies lay dormant in the artificial European man. The horse, transported to the new world, roams in magnificent herds over the boundless pampas; and the hog, restored to a state of nature, has exchanged the grovelling degradation of the stye for the fierce courage of the wild boar. Strange and interesting problems in natural history have there been solved for us; and they help to give an added interest to the question, "What is man's natural state?" while they seem to offer some novel materials fitted for its solution.

> "The friendly and flowing savage, who is he?
> Is he waiting for civilisation, or past it and mastering it?"[1]

So asks one of the freest among the poets of the New World, after more than three centuries of contact and collision between the two extremes. For the problem is a most complicated one; and the materials for its solution have to be gathered from a complex accumulation, whereof we know not as yet what to accept as native, or reject as foreign, to the fully developed man.

In Europe we study man only as he has been moulded by a thousand external circumstances, foreign to his blood, his stock, or the social conditions of his being. The arts and intellectual civilisation, born at the very dawn of history in the great river-valley of Egypt, give form to the social life of England in her nineteenth century. The Divine law given forth from the lightnings of Sinai, and the faith and morals nurtured among the hills of Judah, while yet the British Isles were savage-haunted wastes; the intellect of Greece, the military prowess of Rome, with the phases of mediæval Christendom and enfranchised modern Europe, have all

[1] *Leaves of Grass.* By Walt. Whitman.

inwoven themselves into the warp and woof of the Saxon Englishman and the Gallic Frenchman. Celt and Frank, Roman, Breton, and Saracen, Saxon, Dane, and Norman, have intermingled their blood, their institutions, their physical, moral, and intellectual being; till in the European of the nineteenth century it becomes a curious question how much pertains to the man, and how much to this strange development we term civilisation, of which he is in part the author and in part the offspring? In vain we strive to detach the European man from elements foreign to him, that we may look on him as he is or was by nature; for he only exists for us as the product of all those multifarious elements which have accumulated along the track by which the generations of nineteen centuries have swept "into the younger day." The very serf of the Russian steppes cannot grow freely, as his nomade brother of Asia does; but must don the unfamiliar fashions of the Frank, as strange to him as the armour of Saul upon the youthful Ephrathite. Yet grow he must in some way, in that seething caldron of European civilisation, with its ceaseless change.

Is, then, civilisation natural to man, or is it only a habit or condition artificially superinduced, and as foreign to his nature as the bit and bridle to the horse, or the truck-cart to the wild ass of the desert? Such questions involve the whole ethnological problem reopened by Lamarck, Agassiz, Darwin, and others. Whence is man? What are his antecedents? What—within the compass of this terrestrial arena, with which alone science deals,—are his future destinies? Does civilisation move only through limited cycles, repeating in new centuries the work of the old; attaining, under some varying phase, but to the same maximum of our imperfect humanity, and then, like the wandering comet, returning from the burning splendour of its perihelion back to night?

To some of those profoundly interesting questions the social life alike of the forests and the clearings of the New World seems to offer fresh replies. There at least old problems are being wrought out under entirely new conditions. The very elements of Britain's greatness seem to lie in her slow maturity, in her progressive collision with races only a little in advance of herself, in the natural transition through all the stages from infancy to vigorous manhood. But that done, the old Englander becomes the New Englander; starts from his matured vantage-ground on a fresh career, and displaces the American red-man by the American white-man, the free product of the great past and the great present.

The history of civilisation is, in one sense at least, an inquiry into the development of society, and the progressive growth of man, in his social condition, towards an ideal perfection of civil life. In the calm, ever-present eye of God, each whole race is a unit. To the individual man

> "The drift of the Maker is dark, an Isis hid by the veil."

It would have been poor consolation to the Saxon subjects of the Conqueror to learn that coming generations should look back on the Norman William as the founder of England's greatness and England's freedom. But from the sufferings of the individual have sprung the triumphs of the race, alike in Old and New England; though still, in both, the march of civilisation is over the graves of many victims that perish by the way. Christianity indeed lifts for us the veil of Isis, tells of the Righter of all the wrongs of ages; the Divine one, to whom man is no scientific abstraction of races, but each individual the offered heir of an inheritance the worth of which will make life's greatest sufferings lighter than forgotten infant-tears. Science cannot supersede the

work of the great Consoler; but in searching into those lesser truths with which alone it has to deal, it may grope and peer hopefully, if still darkly, gladdened by the faith which rests on "the evidence of things not seen." Looking, then, meanwhile, on the race as a unit: for modern Europe no less than for the young aspiring communities of the New World, this is the great problem. But hitherto we have been looking, as it were, from within on the system of which we form a part; gauging Europe as our world, and the product of Europe's past, or, at most, of the world's historic past, as though it were the absolute ethnic universe; while in reality we can no more accurately determine the orbit of man's social course and ethnic destiny from such a view, than we can judge of the external form of a building while still within its walls.

While the sanguine students of social science are gazing into that cloud-land of their visible horizon, wherein, as they fancy, they can already discern the dawn of a golden age of perfected subjection of physical causes to the higher moral nature of man, there lies behind us a long-trodden track, in which are still visible many unheeded footprints of the past pointing towards the same goal. Out of what seemingly insignificant causes, lying far behind the times of Romanized Britons or Pagan Saxons, has the social life of the British Islands sprung! The simplest germs of their allophylian arts bear, it may be, just such a relation to their present civilisation, as the unsightly grub does to the perfected beauty of winged life. But prehistoric researches are slow to commend themselves to the conservative Briton. He can follow the geologist now, with honest faith, far behind the birth of history into the protozoic dawn, or the azoic night; but with the ethnologist he insists on pausing where alone he feels a firm foothold, among the Romans

of the Christian era. He is content still, from within, and in one of its narrow aisles, to determine the form and proportions of the vast but incompleted structure; and by what he can see from thence to ascertain its future compass and final plan.

It was with a strange and fascinating pleasure that, after having striven to resuscitate the Allophylian of Britain's prehistoric ages, by means of his buried arts, I found myself face to face with the aborigines of the New World. Much that had become familiar to me in fancy, as pertaining to a long obliterated past, was here the living present; while around me, in every stage of transition, lay the phases of savage and civilized life. The nature of the forest, the art of the city; the God-made country, the man-made town; each in the very process of change, extinction, and re-creation. Here, then, was a new field for the study of civilisation and all that it involves. The wild beast is in its native state, and hastens, when relieved from artificial constraints, to return to the forest wilds as to its natural condition. The wild forest-man,—is he too in his natural condition? for Europe's sons have, for upwards of three centuries, been levelling his forests, and planting their civilisation on the clearings, yet he accepts not their civilisation as a higher goal for him. He, at least, thinks that the white man and the red are of diverse natures; that the city and the cultivated field are for the one, but the wild forest and the free chase for the other. He does not envy the white man, he only wonders at him as a being of a different nature. "Broken Arm," the Chief of the Crees, receiving the traveller Paul Kane and his party into his lodge, at their encampment in the valley of the Saskatchewan River, told him the following tradition of the tribe:— One of the Crees became a Christian. He was a very good man, and did what was right; and when he died

he was taken up to the white man's heaven, where everything was very beautiful. All were happy amongst their friends and relatives who had gone before them; but the Indian could not share their joy, for everything was strange to him. He met none of the spirits of his ancestors to welcome him; no hunting nor fishing, nor any of those joys in which he was wont to delight. Then the Great Manitou called him, and asked him why he was joyless in His beautiful heaven; and the Indian replied that he sighed for the company of the spirits of his own people. So the Great Manitou told him that he could not send him to the Indian heaven, as he had, whilst on earth, chosen this one; but as he had been a very good man, he would send him back to earth again.

The Indian does not even believe in the superiority of the White man. The difference between them is only such as he discerns between the social, constructive beaver, and the solitary, cunning fox. The Great Spirit implanted in each his peculiar faculties; why should the one covet the nature of the other? Hence one of the great elements of the unhopeful Indian future. The progress of the white man offers even less incentive to his ambition than the wary cunning of the fox, or the architectural instincts of the beaver. He, at least, does not overlook, in his sylvan philosophy, that feature in the physical history of mankind, which Agassiz complains of having been entirely neglected by those who have studied the subject, viz., the natural relations between the different types of man, and the animals and plants inhabiting the same regions. The American philosopher has wrought out, as his own scientific creed, the homely faith of the forest Indian. "The coincidence between the circumscription of the races of man, and the natural limits of different zoological provinces, characterized by peculiar distinct species of animals, is one of

the most important and unexpected features in the natural history of mankind, which the study of the geographical distribution of all the organized beings now existing upon earth has disclosed to us. It is a fact which cannot fail to throw light, at some future time, upon the very origin of the differences existing among men; since it shows that man's physical nature is modified by the same laws as that of animals, and that any general results obtained from the animal-kingdom regarding the organic differences of its various types, must also apply to man."[1]

We call this western hemisphere the New World, and fancy that, in its savage Indians, whom we designate *Aborigines*, we are looking on a primitive condition of life. But the Indian of the American wilds is no more primeval than his forests. Beneath the roots of their oldest giants lie chronicled the memorials of older phases of a native civilisation; and while the naturalists of this continent dwell with peculiar interest on the persistency of a common type, and of specific and almost instinctive habits throughout all its widely scattered tribes, they have been studying only the temporary supplanter of nations strange to us as the generations of extinct life in geological periods elder than our own.

In that old East, to which, nevertheless, science as well as revelation still points as the cradle-land of the human family, vast areas exist where the physical characteristics of the earth's surface seem to stamp with unprogressive endurance the inheritors of the soil. We owe to the Asiatic Researches of Humboldt a clear understanding of the physical elements which have so materially influenced the history and progress of that ancient continent. Along the shores of the Indian Ocean and the Levant, and stretching from the Persian

[1] "Natural Provinces of the Animal World," etc., *Types of Mankind*, p. 75.

Gulf into the fertile valleys of the Euphrates and the Tigris, are still found the seats of ancient civilisation and human progress coexistent with the earliest dawn of man's history. But beyond these lies the elevated table-land of Central Asia, stretching away northward, and pouring its waters into inland seas, or directing their uncivilizing courses into the frozen waters of the Arctic circle. Abrupt mountain-chains subdivide this elevated plateau into regions which have been for unrecorded ages the great hives of wild pastoral tribes, manifesting apparently no intrusion of civilizing arts or settled social habits on their rude nomade life; until, compelled by unknown causes to overflow, they have poured southward over the seats of primitive Asiatic civilisation, or westward into the younger continent of Europe; as, also, eastward towards the straits that present such obvious facilities for migration to a new continent; and there, subjected to novel influences, a change of manners and new modes of life have been the results.

The mountain-chains which enclose and subdivide the great table-land of Asia, and stretch westward into Europe, have manifestly exercised an important influence on the distribution of the entire fauna of the two continents, including man himself. A remarkable simplicity of structure is discernible in the arrangement of the continuous lines of greatest elevation, coinciding with such traces as are recoverable of the routes pursued by successive waves of population which have flowed from Asia to Europe; and also indicating the eastern route by which a similar overflow would be guided towards the Okhotsk Sea, and the outlying groups of volcanic islands which stretch away continuously towards the Kamschatkan peninsula, and the Aleutian Island-chain, one supposed and probable route of migration to the American continent. The Altai, the Thian shan, and the Kuen-lun,

constitute continuous lines of abrupt elevation that appear to have served as natural tracks, within the limits of which the nomade races were urged onward by as natural a law as the river is borne seaward in its channel, so long as the overflow of the unfailing fountain presses behind.

But, besides the great table-land of Central Asia, there is also the lesser table-land of Syria and the Arabian peninsula. From the wandering hordes of the great Asiatic steppes have come the Huns, the Magyars, and the Turks, as well as a considerable portion of the Bulgarians of modern Europe. But the sterile peninsula of Arabia, and its wild desert nomades, have given birth to the germs of the most influential moral revolutions on mankind: the Hebrew monotheism, with the ampler and nobler system begotten by it in the fulness of time; and also that Mohammedanism which taught the Ottoman Turk the way to conquest, and stimulated the Semitic Saracen to an intellectual progress which revolutionized mediæval Europe. Yet the capacity for civilisation of the Magyar or Turk, when transferred to new physical conditions, and subjected to higher moral and intellectual influences, or the wondrous intellectual vigour of the Arab of Bagdad or Cordova, affords no scale by which to gauge the immobility of the Tartar on his native steppe, or the Arab in his desert wilderness. Without agriculture or any idea of property in land, destitute of the very rudiments of architecture, knowing no written law or any form of government save the patriarchal expansion to the tribe of the primitive family ties: we can discern no change or progress in the wild nomade, though we trace him back for three thousand years. Even the numerical progression is so partial and intermittent, that had we no other knowledge to guide us, it would be as easy to believe that these nomades had wandered over

their desert homes for thirty thousand as for three thousand years. Migratory offshoots of the hordes of Central Asia, and of the wanderers of the Arabian desert, have gone forth to prove the capacity for progress of the least progressive races; but the great body tarries still in the wilderness and on the steppe, to prove what an enduring capacity man also has to live as a mere gregarious member of the wild fauna of the waste.

The Indian of the New World, whencesoever he derived his origin, presents to us just such a type of unprogressive life as the wild nomades of the Asiatic steppe. The Red-Indian of the forest of the North-West exhibits no change from his precursors of the fifteenth century; and for aught that appears in him of a capacity for development, the forest of the American continent may have sheltered the wild hunting and warring tribes of Indians, just as it has sheltered and pastured its wild herds of buffalos, for countless centuries since the continent rose from its ocean bed. That he is no recent intruder is indisputably proved alike by physical and intellectual evidence. On any theory of human origin, the blended gradations of America's widely diversified, indigenous races, demand a lengthened period for their development; and equally, on any theory of the origin of languages, must time be prolonged to admit of the multiplication of mutually unintelligible dialects and tongues in the New World. It is estimated that there are nearly six hundred languages, and dialects matured into independent tongues, in Europe; the known origin and growth of some of which may supply a standard whereby to gauge the time which such linguistic multiplications of tongues imply. But the languages of the American continents have been estimated to exceed twelve hundred and sixty: elaborate, highly inflected, and peculiar in structure; demanding centuries for their development, but at the

same time singularly suggestive of centuries of nomade isolation: of a savage condition of society, multiplying petty tribes, and fostering the tendency of separated dialects to become mutually unintelligible. Of the grammar of the Lenni-Lenapé Indians, Duponceau remarks: "It exhibits a language entirely the work of the children of nature, unaided by our arts and sciences, and, what is most remarkable, ignorant of the art of writing. Its forms are rich, regular, and methodical, closely following the analogy of the ideas which they are intended to express; compounded, but not confused; occasionally elliptical in their mode of expression, but not more so than the languages of Europe, and much less so than those of a large group of nations on the eastern coast of Asia. The terminations of their verbs, expressive of number, person, time, and other modifications of action and passion, while they are richer in their extension than those of the Latin and Greek, which we call emphatically the *learned* languages, appear to have been formed on a similar but enlarged model, without other aid than that which was afforded by nature operating upon the intellectual faculties of man."[1] At the same time it is no less important to note, along with a highly elaborate structure, the limited range of vocabulary in many of the American languages. These characteristics, taken along with their peculiar holophrastic power of inflecting complex word-sentences, so as to express by their means delicate shades of meaning, exhibit the phenomena of human speech in some of their most remarkable phases. But the range of the vocabularies furnishes a true gauge of the intellectual development of the Indian: incapable of abstract idealism, realizing few, if any, generic relations, and multiplying his words by comparisons and descriptive compounds.

[1] *American Philosophical Transactions*, N. S. vol. iii. p. 248.

To whatever cause we attribute such phenomena, much is gained by being able to study them apart from the complex derivative elements which trammel the study of European philology. Assuming the unity of the human race, not in the ambiguous sense of a common typical structure, but literally, as the descendants of one primal pair: in the primitive scattering of infant nations, the Mongol and the American went eastward, while the Indo-European began his still uncompleted wanderings towards the far west. The Mongol and the Indo-European have repeatedly met and mingled. They now share, unequally, the Indian peninsula and the continent of Europe. But the American and the Indo-European only met after an interval measurable by thousands of years, coming from opposite directions, and having made the circuit of the globe.

The Red Man, it thus appears, is among the ancients of the earth. How old he may be it is impossible to determine; but among one American school of ethnologists, no historical antiquity is sufficient for him. The contributions of the New World to the evidences of man's antiquity have been of a singularly startling nature. The island of Guadaloupe, one of the Lesser Antilles, discovered by Columbus in 1493, furnished the first examples of fossil man, and of his works of art, embedded in the solid rock. They seemed to the wondering naturalist to upset all his preconceived ideas of the origin of the human race; but later investigations have greatly diminished the wonder. The rock proves to be a modern concretionary limestone, of common formation along the tropical coasts from the detritus of corals and shells. The skeletons themselves are probably by no means ancient, even according to the reckoning of American history; though justly valued among the geological treasures both of the British Museum and the

Jardin des Plantes. The Academy of Sciences of Philadelphia treasures a fossil fragment of disputed antiquity, the *os innominatum* of a human skeleton, found beneath the skeletons of the megalonyx and other fossil mammals. Dr. Lund, the Danish naturalist, has described fossil human bones, bearing, as he believed, marks of geological antiquity, found, along with many extinct mammals, in the calcareous caves of Brazil. But since his discoveries were recorded, European geologists have become familiar with similar phenomena, whatever be the ultimate solution of the difficulties they create.

From those, and other discoveries of a like kind, this at least becomes apparent to us, that in the New World, as in the Old, the closing epoch of geology must be turned to for the initial chapters alike of archæology and ethnology. According to geological reckoning, much of the American continent has but recently emerged from the ocean. Among the organic remains of our Canadian post-tertiary deposits are found the *Phoca*, *Balæna*, and other existing marine mammals and fishes, along with the *Elephas primigenius*, the *Mastodon Ohioticus* and other long-extinct species; thus proving that the latter belong to that period in which our planet was passing through its very latest transitional stage, and the New World, as well as the Old, was undergoing its final preparation prior to its occupation by man. To the geologist who deals with phenomena of the most gigantic character, this post-tertiary period, mingling the bones of strangest preadamite giants with contemporary traces of familiar life, is apt to appear of very inferior interest. But to the archæologist and ethnologist its records have a profounder significance. Looking on the fossil human skeleton of the Guadaloupe limestone in the Museums of London and Paris,—the first examples of the bones of man in a fossil state,—we cannot fail to

be impressed with the feeling that, judged of by such remains, the gradation in form between man and other animals is such as to present no very important contrast to the uninstructed eye. Modern, to all appearance, those rock-embedded skeletons are; but they lessen our incredulity as to older traces of fossil human bones mingling with those of the extinct mammals of the drift, and present both alike as sharers in a common sepulchre.

"But the novel phenomenon of fossil human bones is the pregnant index of the mightiest change which has transpired upon our planet since first it became the theatre of life. Genera and species have come into being, multiplied through countless ages, and then given place to others. But now, for the first time, there appears among the fossil relics of former existence the traces of that latest creation, when God introduced into earth's varied life a reasonable soul, the heir of immortality. That latest creation, man, with his beginning constituting the oldest conceivable range of historical antiquity, entered on the occupation of this New World in centuries which stretch backward, as we strive to explore them, towards such beginnings of time. His early history lies buried among the treasures of oblivion, for it is not yet four centuries since the Red man and his western world were made known to us; and he still exists as he did then, a being apart from all that specially distinguishes either the cultivated or the uncultured man of Europe. His continent too, has become the stage whereon are being tested great problems in social science, in politics, and in ethnology. Here the civilized man and the savage have been brought face to face, and have striven to coalesce, to share together the bounties of nature and art, to prove that God "giveth to all life, and breath, and all things; and hath made of one blood all nations of men for to dwell on all the face of the earth, and hath

determined the times before appointed, and the bounds of their habitation." Here, too, the black man and the red, whose destinies seemed to separate them wide as the world's hemispheres, have been brought together to try whether the African is more enduring than the American even on his own soil; to try for us, also, as could no otherwise be tried, questions of amalgamation and hybridity, of development and perpetuity of varieties of a dominant, a savage, and a servile race. In all ways: in its recoverable past, in its comprehensible present, in its conceivable future, the New World is a great mystery; and even glimpses into its hidden truths reflect some clearer light on secrets of the older world.

CHAPTER II.

THE OLD WORLD AND THE NEW.

THE contrast which exists, in a thousand ways, between the Old World and the New, cannot be described. Words may picture the manifold associations entwined with every historic scene, but they cannot awaken the spirit that steals over the least thoughtful mind which has been nurtured amid the inspirations of a landscape vital with the memories of his country's history, or haunted with the poetry of its legends and songs. Neither can words convey to the old dweller amid Europe's thousandfold associations and inherited ideas, the strange sense of freedom that stirs the blood in the New World's clearings, where there is nothing to efface, to undo, to desecrate. The very forests of the New World have nothing sacred or venerable about them. The consecrating touch of time is rarely traceable on the tall crowded trunks that struggle upwards to catch the sunshine on their spare topmost boughs. They seem made for the woodman and the lumberer's axe; and the freshest wanderer from the silvan haunts of England sees without a pang the leafy monarchs of the primeval forest bow before their stroke. There is even an exulting sense of triumph as the lofty pine crashes through the dry branches of the wintry forest, and lays prone the stately stem. The mind is in a new atmosphere no less than the body. All old motives

and impulses have suffered a change. It is indeed a new world, and the contrast between the Old World and the New must be felt to be fully understood.

Much that awaits the world's future is to be born of this fresh freedom, hewn out of America's forest wastes; but it is not to be forgotten that along with this the associations of the Old World still assert their hold on the new settler. In spite of himself, the American, even on his annual Independence-day, speaks of Old England as "home." Under the yews of its ancient grave-yards his fathers sleep; around its wild ruins linger the storied memories of his past; and its common law is the code of his civil wellbeing. He, too, is the child of the past, and the Old World as well as the New has helped to make him what he is. Ere we attempt to unravel the mysteries of both hemispheres in relation to their prehistoric centuries, let us try to picture some of the strange elements that render so diverse two separate spots of our common mother-earth: to contrast the present before attempting to compare their past.

Standing on the vantage-ground of Europe's old historic soil, the student of antiquity seems to lay hold on the last link of an unbroken chain stretching away into the remote and mysterious centuries that lie behind him. In that insular microcosm of Britain, he finds on every hand an epitome of the whole, and can select for his special purpose spots rich in their connected series of pregnant disclosures of the past. And singularly fascinating is it to linger over such favourite haunts of the memories of other times, and trace out the footprints of long-forgotten ages, following the trail until it is lost amid the vestiges of preadamite life; fascinating is it to dwell on any scene of history, and feel there that the past is present to the mind. Five years of colonial life had passed over me, busily and pleasantly occupied in

the unstoried capital of Upper Canada, when I first visited Quebec, and traced out the scenes of Wolfe's and Montcalm's last days, and the older haunts of *la Nouvelle France* under the vicegerents of its Bourbon kings. It was like the recovery of a lost sense, the revival of a long-forgotten delight. But what are all the heart-stirring associations of Quebec when placed alongside of the memories clustered around some favourite spots, or the strange associations with ages beyond the reach of memory which add an interest to other scenes? Take, for example, the famous Kent's Hole of Torbay. That well-known Devonshire cavern is a huge chasm some six hundred feet in length, which has proved the most productive ossiferous cave in England. Some of the choicest specimens of extinct carnivora, the *Ursus spelæus*, the *Machairodus latidens*, etc., now enriching the geological galleries of the British Museum, were procured from beneath its stalagmitic paving, along with bones of the fossil elephant, rhinoceros, and other memorials of preadamite times: when the British isles were still a prolongation of the neighbouring continent, and the seas had not yet made of their inhabitants Virgil's

"Penitus toto divisos orbe Britannos."

But so far Kent's Hole differs in no very essential point from the ossiferous caves of Brazil. Its skeletons are the relics of a world of life which, for the most part, came to an end before our race had its beginning; yet to the geologist they are among the most modern of organic remains, and have lost their chief interest since the late Dean of Westminster read his recantation of the *Reliquiæ Diluvianæ;* so relative a thing is antiquity to man with his own span of threescore years and ten. But Kent's Hole has other disclosures not less interesting to us; for the same stalagmitic incrustations

had enclosed memorials of primitive art of the British Troglodyte, belonging to a period when the precursors of Watt and Stevenson had not yet acquired the rudiments of metallurgic arts, or even the knowledge of metals, but employed their constructive instinct on bone or flint, and fashioned clay into hand-made pottery as rude as any gathered on the sites of Indian wigwams in the Canadian clearings. Thus linking together the last preadamite and the first of human periods, the chronometry of the Devonshire cavern descends by a regular gradation to modern centuries. Situated at a peculiarly attractive spot on the southern coast, Kent's Hole appears to have been a favourite haunt of England's *ferœ naturæ* during a long transition between the geological period of the drift and the primeval era of the archæologist, when it became a scarcely less favourite resort of man. Succeeding to rudest primitive weapons and implements of flint and bone, come the more ingenious fictile ware of Celtic times; the artistic pottery of the Roman of the second and third centuries; the iron spearheads and other products of the Saxon artificer of the sixth and subsequent centuries; until at length, turning to the lettered memorials of more recent times graven on the cavern walls, we trace out from among those of various dates this simple inscription—"W. HODGES OF IRELAND, 1688." For we are on historic ground. In a mild autumnal noon, on the 5th of November 1688, the Dutch fleet, sailing under the genial southern breeze, which so opportunely sprang up to the discomfiture of Dr. Burnet's predestinarian doubts, rounded the lofty cape of Berry Head, and cast anchor in the harbour of Torbay. The spot where William of Orange landed is still a just object of interest; and so, too, in its own degree, is that record of some protestant Irish follower of the Prince, who, straying into Kent's Hole Cave, left

there the graven memorial of his presence at so momentous a time. "Since William looked on that harbour," writes Macaulay, "its aspect has greatly changed. The amphitheatre which surrounds the spacious basin now exhibits everywhere the signs of prosperity and civilisation. At the north-east extremity has sprung up a great watering-place, to which strangers are attracted from the most remote parts of the island by the Italian softness of the air; for in that climate the myrtle flourishes unsheltered, and even the winter is milder than the North-umbrian April. The inhabitants are about ten thousand in number. The newly-built churches and chapels, the baths and libraries, the hotels and public gardens, the infirmary and the museum, the white streets, rising terrace above terrace, the gay villas peeping from the midst of shrubberies and flower-beds, present a spectacle widely different from any that, in the seventeenth century, England could show. But Torbay, when the Dutch fleet cast anchor there, was known only as a haven where ships sometimes took refuge from the tempests of the Atlantic. Its quiet shores were undisturbed by the bustle of either commerce or pleasure; and the huts of ploughmen and fishermen were thinly scattered over what is now the site of crowded marts and of luxurious pavilions." Thus it is amid the storied haunts of the Old World. Looking down here into one of its little eddies, we catch a glimpse of the unresting stream of Time; and tracing it upward by the historic memorials along its banks, as we leave the last of these behind us, we find them to pertain to the same mighty river which flows continuously from that mysterious past, teeming with the palæontological organizations of ages seemingly too countless for the puny reckonings of man.

America has her ossiferous caverns, with their mummied inheritors; but only on the historic sites of the

Old World can we look for such a curious epitome of the past as is thus presented to us in that narrow indentation of the English Channel. Or let us pause again over one other and not less familiar scene. When the lamented Hugh Miller, in that last work of his pen, the *Testimony of the Rocks*, aims at reproducing before the mental eye the actual submergence of man's antediluvian world, he places the reader on the top of Arthur's Seat, bids him watch, in fancy, the encroaching ocean-tide reach its summit, then gather till the highest peaks of the Pentlands, and then the still visible crest of Ben Lomond, successively disappear: and the drifting ark floats away, through a seemingly shoreless sea, towards the unsubmerged height of the distant Ben Nevis. It is a scene which has made many geologists; and on which the eyes of the poet, the historian, and the philosopher gaze with kindred rapture. On the slopes of that picturesque hill, from which the geologist assumes his diluvial observer to look forth, have been dug up, in very recent years, the stone implements and pottery of Britain's primeval human era, and the beautiful leaf-shaped swords, and other specimens of bronze workmanship, the artistic products of Britain's infantile metallurgic arts. In the valley below lie the Rood Well, the ruined Abbey, and the Palace of Holyrood, pregnant with a thousand scenes of historic romance; and in the long picturesque thoroughfare which climbs toward the height crowned by the ancient castle of Edinburgh—still bearing on its summit the little oratory of the Saxon princess, St. Margaret, nearly coeval with the Norman Conquest;—may be seen the Roman sculptures of Severus and his Empress Julia, separated by an inscription of later times, borrowed from Gutenberg's first Mentz Bible, of 1455.

Looking abroad over the same landscape towards Ben

Lomond's lofty summit, but with other eyes than those of the geologist, the observer catches, on a clear day, the distant ramparts of Stirling Castle, with the silver links of the Forth winding through the broad level carse between. And on no richer historic landscape did eye ever gaze. Far back, in distant prehistoric ages—as modern discoveries have disclosed to us,—the allophylian savage pursued there the gigantic cetacean monsters of the deep, armed with his rude lance of deer's horn, and his harpoon tipped with flint. The Roman only saw a very modern generation compared with that primeval Caledonian fisherman, whose harpoon—found beside the stranded whale at the foot of the Grampians, which no tide has laved for three thousand years,—is now preserved, with the bones of the long-stranded whale, in the museum of Edinburgh University. Time had wrought his silent changes on that scene. The bed of the broad estuary had been slowly upheaved, until it became the alluvial carse-land which now stretches its fertile fields between the Campsie and the Ochil hills; where, in the first century of our era (A.D. 84), Agricola led the Roman legions across the fords of the Forth, to the camp at Ardoch, and the famed battle-field of Mons Grampius. The flint arrowhead and the stone battle-axe of primeval times, as well as the horn lance and harpoon, have been turned up on the Carse of Stirling, and many an older hero than the Caledonian Galgacus may have there done deeds of valour which were not always unsung; but for us that year, A.D. 84, marks, as it were, the baptism of blood which consecrated the scene to gallant deeds of arms.

And so, the eye of the favoured onlooker, ranging over that level carse-land, paled in with its grand fringe of hills, leaves behind the old scenes of Roman conquest, the subject Damnonii of Ptolemy's times, and the mythic

warfare of Picts with Scots, in the dim dawn of later centuries; till it rests once more on the authentic fragment of Cambuskenneth Abbey, founded by David I. in 1147, and then on to the thirteenth century, where once more it revels in the rich succession of historical memories. There, beyond Cambuskenneth Tower, is the Field of Stirling Bridge, where the army of the English Edward, under Warenne and Surrey, was utterly routed by Wallace with an inferior force; and there the Field of Falkirk, where, in the following year, Edward was the victor, at the head of eighty-seven thousand men. There, too, lies the world-famous Field of Bannockburn, where, in the succeeding century, the Bruce was victor over another Edward; the Field of Stirling, where, in the fifteenth century, James III. perished: his own son, the chivalrous James of Flodden, among the rebellious victors. The following centuries have each their battle-field, haunting the same glorious landscape with the memories of other times: Montrose's last victory, in his brilliant campaign on behalf of the descendants of those Scottish Jameses in 1645; and Prince Charles Edward's bootless triumph a century thereafter, when, on the old Field of Falkirk, in 1746, fortune gleamed, for the last time, a parting smile on the fallen Stuarts.

Those only who have dwelt amid scenes without a history can fully appreciate the unconscious influences of such a vital historic page. It is the mould from which the national mind takes shape, be it for good or evil; the inheritance in trust, which fashions from the cradle the moral being of the future man.

> "We read the dictate in the infant's eye;
> In the wife's smile; and in the placid sky;
> And at our feet, amid the silent dust
> Of them that were before us."[1]

We cannot overlook the silent influences of a *new* world,

[1] Wordsworth: *Sonnets to Liberty*, xi.

in making another man out of the old English stock. They are strong and ever present; nor unperceived by the intelligent American, who yearns for the fond associations of the fatherland, amid all his pride in that new kingdom won for himself from nature. This, too, is a lesson from the new world to the old. These are elements of change for the ethnologist to ponder, before lending himself to that fatal error which assumes that, in treating of the natural history of man, the intellectual element is of no more account than in the history of the ape or the hog. The ox transported from the old Scottish carse-land seeks only as rich pastures as he left in that alluvial valley; but the herd-boy feels that they left behind them other things besides a fertile soil. The landscape, teeming with such rare historical associations, would be a glorious one were it barren as the rawest clearing of the west, that unveils its rough acres to the strange brightness of the sunshine, and spreads abroad its widening area, like a clear parchment, for the history of the future. But the associations of the scene become, to them to whom it is their birthright, a part of their being. The very earth beneath their feet is as the ashes scattered from some sacred urn, with which in time they may be well content their own shall mingle, to rest in kindred earth.

To gaze on scenes like those, not with the mere curious look of the passing tourist, but fondly, as day by day their familiar associations intertwine with the heart as well as the soul, is to be elevated by a teaching better than all the wisdom of the schools. But the country so rich in manly lessons for her children, grows men to send them wherever such are needed; and when, as with a step-dame's voice, she tells the young adventurer:

"Then not in Britain must you bide!"

it is with somewhat of the fond loving irony of Imogen that he replies :

> "Where then ?
> Hath Britain all the sun that shines ? Day, night,
> Are they not but in Britain ? In the world's volume
> Our Britain seems as of it, but not in it ;
> In a great pool a swan's nest. Prithee think
> There's livers out of Britain !"

And so the wanderer goes forth to help to sow in other soils what makes historic lands. Taking our stand with him amid one of the newest scenes of the new world, let us see what it has to offer for the mind as well as the eye. Nor could a greater, or more striking contrast to the old Scottish metropolis be anywhere found, than is presented by the young and flourishing capital of the most flourishing colonial province of the empire.

Built along the margin of a bay, enclosed by a peninsular spit of land running out from the north shore of Lake Ontario, Toronto, the political and commercial capital of Upper Canada, rests on a drift formation of sand and clay, only disturbed in its nearly level uniformity by the rain-gullies and ravines which mark the courses of the rivulets that drain its surface. This the original projectors of the city mapped off into regular parallelograms, by streets uniformly intersecting each other at right angles ; and in carrying out their plan every ravine and undulation is smoothed and levelled, as with the indiscriminating precision of the mower's scythe. On a clear day the observer sees directly to the south a curious vapoury cloud hanging on the horizon, which marks the scene of Niagara's unresting plunge into the abyss of waters. A slightly undulating coast line indicates the State of New York, stretching along the southern shore of the lake ; but no mountain, nor height high enough even to overtop the lofty pines, which here and there linger as solitary survivors of the natural

forest, exists nearer than the distant shores of Georgian Bay. The country rises to the north for about twenty miles, by a gradual slope, to the water-shed between Ontario and Lake Simcoe, and then descends by a still more gentle inclination to the level of the northern lake, and the old hunting-grounds of the Hurons. It is a nearly unvarying expanse, a blank: with its Indian traditions effaced; its colonial traditions uncreated. But industry already plies there the willing hand. Sturdy enterprise enlivens its rivers with the noise of the busy wheel, and fashions anew its forest glades into smiling villages and rising towns. Its history is not only all to write, it is all to act. No country could present a more striking contrast to that magnificent panorama of firth, and mountain, and fertile plains, amid which rises the acropolis of the North. The cities of the old world have their mythic founders and quaint legends, still commemorated in heraldic blazonry. But there is no mystery about the beginnings of Toronto, and little romance in its childhood and youth. Upper Canada was erected into a distinct province in 1791, only eight years after, by the Treaty of Fontainebleau, France had finally renounced all claim on the province of Quebec; and a few months thereafter we have record of the arrival of General Simcoe, the first governor of the new province, at the old French fort, at the mouth of the Niagara river, and his selection of the Bay of Toronto as the site of the future capital. Governor Simcoe visited the chosen spot in the month of May 1793; explored the swamps and uncleared pine forest, amid which his sagacious eye saw in anticipation the city rise, which already numbers upwards of 50,000 inhabitants; and gave a name to the place of his choice. To his practical mind the Indian name of the locality had no charm. Himself a Yorkshire man, as well as a soldier under the Duke of

York, he called his new capital YORK; and to the streams which bound its area east and west, he gave the familiar names of the Humber and the Don: dear, perchance, to the rough soldier by the associations of other days. Colonel Bouchette, Surveyor-General of Lower Canada, was selected to lay out the new city and harbour; and from his pen we have a graphic account of the locality as it existed before the spade of the builder first wounded its virgin soil. The rites, too, by which the founder consecrated the site of the destined city are recorded by its surveyor in courtly style. No plough with brazen share was guided round its limits by the founder, *incinctus ritu Gabino,* with careful hand disarming the mystic ploughshare at the destined entrance to the city's gates; but with rites approved by ancient Saxon usage, the first clearing from the wild forest was dedicated to the amenities of civilisation. "It fell to my lot," says Colonel Bouchette, "to make the first survey of York harbour in 1793. Lieut.-Governor the late General Simcoe, who then resided at Niagara, having formed extensive plans for the improvement of the colony, had resolved on laying the foundations of a provincial capital. I still distinctly recollect the untamed aspect which the country exhibited when first I entered the beautiful basin. Dense and trackless forests lined the margin of the lake, and reflected their inverted images in its glassy surface. The wandering savage had constructed his ephemeral habitation beneath their luxuriant foliage, the group then consisting of two families of Mississagas; and the bay and neighbouring marshes were the hitherto uninvaded haunts of immense coveys of wild-fowl; indeed, they were so abundant as in some measure to annoy us during the night. In the spring following, the Lieutenant-Governor removed to the site of the new capital, attended by the regiment of Queen's

Rangers, and commenced at once the realization of his favourite project. His Excellency inhabited, during the summer and through the winter, a canvas house, which he imported expressly for the occasion; but, frail as was its substance, it was rendered exceedingly comfortable, and soon became as distinguished for the social and urbane hospitality of its venerated and gracious host, as for the peculiarity of its structure."[1]

The vicissitudes attending the progress of the Canadian city have been minutely chronicled; for already it has its local historians, who have recorded how many dwellings of round logs, of squared timber, or more ambitious frame-houses, the latter alone exceeding a single storey, were in existence at various dates. The first vessel which belonged to the town, and turned its harbour to account; the first brick house, the earliest stone one; and even the first gig of an ambitious citizen, subsequent to 1812: are each and all chronicled with pious care. Could we but learn with equal truthfulness the first years of the city built by Romulus on the Palatine Hill, its annals would tell no less homely truths, even now dimly hinted to us in the legend of the scornful Remus leaping over its infant ramparts. Tiber's hill was once the site only of the solitary herdsman's hut; and an old citizen has described to me his youthful recollections of Toronto, as consisting of a few log-huts in the clearing, and a small Indian village of birch-bark wigwams, near the Don, with a mere trail through the woods to the old French fort, on the line where now upwards of two miles of costly stores, hotels, and public buildings mark the principal street of the busy city. Another Indian trail trended northward from the bay, nearly on the line where Yonge Street now stretches its undeviating thoroughfare, like the old Saxon Wátlinga-

[1] *The British Dominions in North America.* Lond. 1832. Vol. i. p. 89.

stræt, some forty miles to Lake Simcoe. The unfathomable sloughs of mud in the unpaved streets, are still a byword among all who remember little York. But in 1813 a great historical event occurred. General Dearborn at the head of an army of American heroes, numbering some two thousand five hundred men, embarked on board their fleet at Sacket's Harbour, on the southern shore of the lake. Their object was the siege of York, and the conquest of Canada. The little capital, with its round log, squared timber, and frame-houses, numbered scarcely an hundred dwellings in all. These the heroic invaders set fire to, carried off the solitary fire-engine of the poor little village, and the latter is reported to be still among the trophies of victory preserved in the Navy Yard of the United States!

After such a disastrous erasure of all that the first twenty years of the infant capital had laboriously accomplished, it is easy to see how the abortive city might have been resigned ere this to forest and swamp, and scarcely a trace have remained to tell that civilisation had ever meditated making the site her own. The very year before York, on being incorporated as a city, resumed its older name of Toronto, M. Theodore Pavi recorded in his *Souvenirs Atlantiques*, published at Paris in 1833, that it was still in the woods, a mere advanced post of civilisation on the outskirts of a boundless forest waste. "To the houses of York," says he, "succeed immediately the forests, and how profound must be those immense forests, when we reflect that they continue without interruption till they lose themselves in the icy regions of Hudson's Bay near the Arctic Pole."

A full quarter of a century has elapsed since M. Pavi noted the growing city of the forest, and that for New-World cities is an æon. Every year has witnessed more rapid strides, alike in the progress of Toronto, and in the

clearing and settling of the surrounding country. Railways have opened up new avenues of trade and commerce, and borne troops of sturdy pioneers into the wild wilderness behind. So rapid has been the clearing of the forest, and so great the rise in the price of labour, that fuel, brought from the distant coal-fields of Ohio, already undersells the cord-wood hewn in Canadian forests; and even Newcastle coal warms many a luxurious Canadian winter hearth. All is rife with progress. "Onward!" is the cry; a distant and boundless future is the goal. The new past is despised; the old past is altogether unheeded; and for antiquity there is neither reverence nor faith. These are beginnings of history; and are full of significance to those who have wrought out some of the curious problems of an ancient past, amid such rich historic scenes as are here contrasted with this unhistoric but vigorous youth of the New World. And yet, as we shall see, it is not altogether new; though we thus witness the seeds of future empires taking root on its virgin soil. The ancient forests which give way before the axe of the new settler, are not primeval. Beneath their roots lie the memorials of a living world of man, not even now so thoroughly effaced that we must abandon all hope of recovering the chronicles of that world before Columbus, and learning something of what man was, utterly disassociated from everything which has made of us what we are. It is with the old things of the New World that we propose to deal; and how old some of these are is as yet very partially appreciated, even by some who seek to antedate the birth of the red man before the first Adam was placed in his eastern Garden, or "there went up a mist from the earth, and watered the whole face of the ground."

But recent as is the growing capital of Upper Canada, it is not one of those chance-formed cities so common in

the New World, dropped seemingly wherever the clearing made room for them, and left to grow and thrive like seeds scattered by the wind. Its site was selected with sagacious foresight by the first governor of the province; and the advantages which then offered themselves to his observant eye, had existed ages before, with the same ready facilities for a civic centre of civilisation; though the tangled thickets of the forests revealed only the haunts of the wild bear, or the fragile lodges of the savage. But many a scene as waste and desolate covers the graves of populous cities; and from underneath the tread of busier thoroughfares than the streets of Toronto have been disentombed the civic and national chronicles of empires that attained their prime, and wasted and disappeared, while yet the world of man was in its youth. To such disclosures the attention of the British student of antiquities has been recently directed with peculiar interest. For nearly twenty years, previous to 1840, an extensive system of drainage carried out within the ancient limits of the city of London, and beyond these throughout the widening area of the modern British metropolis, disclosed a remarkable series of memorials of the Roman LONDINIUM of the first centuries of the Christian era, as well as many remains of the Saxon LUNDEN-BURH, and the mediæval LONDON. A succession of archæological strata told the tale of London's early British, Roman, Saxon, and English history, by disclosures akin to those whereby the geologist is enabled to decipher the records of a more ancient life. Digging down in the very centre of Londinium Augusta, in the vicinity of the Exchange, the excavator lays bare an artificial soil of nearly fourteen feet, the *Tertiary Strata*, as we may designate it, of its archæological formations. Beneath this, which consists of the accumulated factitious soil and embedded relics of more than a thousand years,

lie the diverse strata of the *Upper Secondary* formation, some two feet thick; composed chiefly of brick, the buried ruins of a city long forgotten. Underneath this again lie the *Carboniferous Strata* of the London archæologist: the memorials of a town built of wood, and desolated by fire; and below all these are found, what constitute, in the estimation of Roman antiquaries at least, their *Primary Strata*, enclosing in the rich *débris*, the relics of the arts and civilisation of the true Londinium Augusta. And beautiful and full of interest are the varied disclosures of those Roman strata. Tesselated pavements; architectural and sculptured marbles; frescoed plaster, still bright with the pigments of sixteen centuries ago; inscribed altars and tablets, and impressed bricks; coins, bronzes, glass, and pottery; the skulls and bones of the *Bos longifrons*, the domesticated ox of the Anglo-Romans; the tusks of the boar; the accumulated shells of the oyster, and other edible molluscs; with many another relic of long-buried generations: the easily deciphered hieroglyphics of a series of chapters of England's early domestic and social life, such as Tacitus never dreamt of recording, yet which to us have an interest far beyond what the lost books of Livy could possess. So numerous have such relics proved, that the collections of one indefatigable antiquary alone, Charles Roach Smith, have been secured for the British Museum at a cost of £2000, and embrace upwards of a thousand articles: the memorials of many recorded, but of still more unrecorded events; of that terrible catastrophe in the reign of Nero, when 70,000 of the inhabitants of Roman London perished in its ruins; of later sack and conflagration, under Celt, Saxon, Dane, and Norman, till nearly every relic of an old British metropolis was once more swept away, in the wake of a devastating pestilence, by the Great Fire of 1666. Yet

even this large collection very imperfectly illustrates the wealth of historic treasure inhumed in the buried *débris* of ancient London. Four other large collections of Roman, Saxon, Norman, and mediæval articles are referred to in Mr. C. R. Smith's Catalogue, as having been formed during the same excavations of recent years.

Thousands of coins, Roman, Saxon, and mediæval, tell in chronological sequence the annals of the British metropolis. Bronzes and marbles of rare beauty show how the arts of the Tiber found a home on the Thames; and inscribed altars, tablets, and sepulchral slabs, reveal the evidences of a long-extinct faith, and of griefs and triumphs stilled alike in the silence of long-buried centuries. Yet what is London's archæological history, when compared with the story inurned beneath the streets of modern Rome or Jerusalem, or hidden under the shapeless mounds still unexplored in the old eastern cradle-land of our race? When the sculptures were hewn, and the marble palaces built, that lie there entombed, the island-home of the Anglo-Saxon was, in all probability, a tangled forest, trackless as the wilds of America's unexplored west; the centre of the world's commerce on the Thames, was a savage jungle where the wild-boar and the wolf disputed possession. Certain it is that, a thousand years thereafter, the Anglo-Saxon race was not yet in being. Over one of those cities of the East, already a ruined grave-mound, Xenophon led his ten thousand Greeks, four centuries before our era began; and, from the same heap of reedy and sepulchral clay, twenty-two centuries thereafter, have been exhumed the buried arts of that "exceeding great city" Nineveh, to which the prophet Jonah was sent, some two thousand seven hundred years before, to proclaim its threatened doom. That doom, though averted for a time, was most fully accomplished. Nineveh, and the vast power of

Assyria fell. Empire moved westward from the Tigris to the Euphrates; and centuries ere that British London had its beginning—on the novel scenes of which the human-headed lions of Nineveh now gaze forth from their strange stony eyes,—the Euphrates and the Tigris alike swept southward through desolate wastes. The great plain which stretches between these ancient rivers, naturally one of the most fertile areas of the globe, has been abandoned to the wild Arab nomade, who still pastures his steed on the grave-mounds of the world's eldest empires. And he, too, has dropped there some faint traces of his presence. Turkish Islamite has feebly struggled with the desolation; the ancient Greek, the Hebrew, the Arab, and the modern Tartar, have alike passed across the waste scene, each leaving some footprint behind him; and thus have been recovered from its choicest spots the accumulated traces of many successive generations, from times not greatly more modern than that of the first "mighty hunter," down to the recent centuries of Turkish acquisition and misrule.

So relative a thing is antiquity! The ossiferous cavern relics, and the diluvial disclosures of the geologist, are his modern formations. To the archæologist, they are so old as scarcely to be admitted within his most ancient eras. And so that buried Roman London, disclosed in recent years in draining its modern successor, becomes itself a very modern thing when placed alongside of the excavated mound-heaps on the banks of the Tigris. Yet for us it has an interest such as the marbles of Nineveh cannot possess. They indeed belong to that strangely interesting cradle-land of the human family; but the old Roman Londinium, the Saxon London-burgh, and the later mediæval London, each and all pertain to the little island-home of the

Anglo-Celtic and Saxon race, where it was cradled, and nursed, and trained for conquering and colonizing continents of unknown western and southern seas.

Turning from the history of the old world's infancy to the modern scenes of the new world, we seem to return to primeval times, and to witness anew the birth of human society. During recent years passed in Toronto, it has been my fortune to witness on its own scale, the inauguration of the same process which has revealed to modern eyes the buried London of Roman times. Within that period the first works projected and carried out to any extent for the purpose of drainage have been in progress; and at the same time an esplanade and railway track have been cut and embanked along the bay, throughout the entire length of the city's lake shore. Already familiar with historic disclosures derived from similar excavations on older sites, I have watched such trenching of the young city's virgin soil with singular interest. True it is, that the city itself is of most modern growth,—younger indeed than many of its inhabitants; that its history is known in all its simple details, and that its precursor was but a group of Mississaga wigwams in the tangled pine forest. But the Arab who reared his tent unconsciously over the graves of Assyria's and Babylonia's mighty empires, is not so greatly the superior of the Indian of the New World. Humboldt, indeed, draws the comparison between the roaming Indian of the Orinoco, and the wandering Arab, as severally the types of a nomade agricultural and pastoral people, each occupying a like rank in the social scale. The ephemeral tents of the Arabs on the Nimroud mounds gave no indication of the gigantic sculptures below, which so astonished and terrified them when first brought to light. The winged human-headed lion, the symbolic type of the divine intellect, strength, and ubiquity, had awed

and instructed races that flourished there three thousand years before: to the rude Arabs it was an accursed "Jin," which they spat on and defiled: "One of the idols which Noah—peace be with him!—cursed before the flood!" It was not, therefore, an altogether inconceivable thing that here too, where so recently the ephemeral wigwam of the Mississaga stood, the modern Canadian city had but resumed a deserted site of older civilisation. But the world before the Flood is the only one which the trenches made by the fresh civilisation of Canadian cities disclose. A solitary Indian stone axe and a few flint arrow-heads are all that, after minute inquiry, I can learn have been found. Repeatedly, at but a few inches beneath the public thoroughfare, the charred or hewn stump of the forest pine reveals itself; or, in the lower and older parts of the city, towards the lake, the prostrate trunk and the black swampy soil, show where the persevering energy of the European settler has already reclaimed hundreds of acres from the marsh and the lake.

This land conquered from river, lake, and sea is a singularly significant feature of the change that has come over the New World since its soil passed from the hands of its autochthones to the strangers by whom such reclamation has been already wrought. So common and characteristic of the energy of the European colonist is this process, that "water-lots" is a term of universal acceptance among Anglo-Americans, in reference to spots mapped off for redemption from river or lake; and acres of such freely change hands at constantly increasing prices; though, to the inexperienced European, an acre in dreamland or a bag of moonshine would seem equally marketable. During the summer of 1855 a long western ramble, far beyond the regions reclaimed from the wild forest, terminated at Fond du Lac, at the head of Lake

Superior. Here, at the mouth of the Nemadji river, on a large bay into which the St. Louis and Alpues rivers also debouche, the site of the future city of Superior has been selected. I had traversed nearly four hundred miles since leaving the Sault Ste. Marie, itself a remote outpost of civilisation; and had noted with curious interest, in proof of our wandering into uncultivated wilds, that part of the freight of the steamer to Eagle Harbour consisted of compressed bundles of hay, brought from Detroit on Lake St. Clair, upwards of three hundred miles off, for the use of the cattle employed at the copper mines on Keweenaw Point. Hundreds of miles of unoccupied land lay between the Nemadji river and the nearest settlements of Wisconsin or Minnesota, and countless millions of acres stretched away westward and northward towards the Rocky Mountains and the pole. Yet here, on the wild hunting-grounds of the Chippewas, the future Superior City was being laid off with a large expanse of water-lots, to be redeemed from the Lake. A plan, already completed, showed them encroaching on the channel of the Nemadji River, and abridging the wide expanse of Superior Bay: a singularly characteristic type, as it appeared to me, of the intrusive race which is everywhere supplanting the aboriginal Indian on his native soil. A party of Saultaux Indians had constructed a little group of birch-bark wigwams on Minnesota Point, and their slight canoes glided noiselessly over the bay. Such the Indian of the Fond du Lac may have been a thousand years ago; as unprogressive and ephemeral in all his characteristics as he there appeared, totally indifferent to the schemes of the supplanter, who was already marking off his birthright for transference to new heirs. The little spot on which his wigwam stands suffices for him, as it has done for all his fathers; and, for the rest, he claims only a small tribute from the

denizens of lake and forest, wild as himself. But for the aggressive aspirations of the intruder nothing is too great; and it fails to suffice him, though standing at such a point he can look abroad and hear in no uncertain voice the fiat which proclaims: "Lift up now thine eyes, and look from the place where thou art, northward and southward, and eastward and westward; for all the land which thou seest, to thee will I give it, and to thy seed."

The sagacity and experience of Anglo-American enterprise has thus "dipped into the future, far as human eye could see;" and indeed such is the faith in the great future which awaits this most western embryo metropolis of the lakes, that two rival cities were already projected within a mile or two of each other. One of these, at the mouth of the Nemadji river, consisting of an unfinished frame house and two or three log-shanties, was named SUPERIOR; the other, if possible in a still more rudimentary condition of development, had already engrossed the more ambitious name of SUPERIOR CITY. Yet one or other of these is unquestionably the nucleus of a great metropolis, destined ere another generation passes away, to number its inhabitants by thousands, where now only the wigwam of the Indian and the bivouac of the hunter are to be seen. In the coarse realities of conflict between rival speculators and scheming projectors, it is difficult for us to realize what may be abundantly manifest to other generations: that here, in the wild west of the New World, is an event akin to that when Nimrod, the primeval hunter, began to be a mighty one before the Lord, and the beginning of his kingdom was Babel in the land of Shinar.

With such ideas present to my mind, intermingled with recollections of many pleasant explorations on

ancient civic sites, it was with a peculiar interest that I scanned this locality as the virgin soil already dedicated to an unborn history; and seemed in it to realize the primeval aspect of sites on the Nile and the Tigris, ere human hands selected them for the arenas of histories now so rich in mystery and grandeur for all time. Nor is the chosen site of the civic queen of Lake Superior devoid of remarkable features, individualizing it from among the future areas of urban settlement. The terraces and ancient beaches of Lake Superior abundantly prove the vast changes which have taken place in the relative levels of land and water on this great inland sea. But besides this, the lake shores present another series of striking phenomena. The Pictured Rocks, near the eastern end of the south shore, extend for upwards of ten miles in a range of lofty cliffs rarely surpassed in picturesque magnificence. The north shore is also marked by many features of great boldness and grandeur; but the general character of the southern shore is an undulating coast line, covered with the natural forest down to the water's edge. The rivers and streams accordingly, of which two hundred and twenty of varying size and volume are tributaries to this great inland sea, generally enter it over sandy or alluvial flats; and the parallel walls of loose materials formed by the opposing action of the river currents, and those driven by the prevailing winds against the descending flood, present a series of concentric river-belts, extending over several miles of the embouchure. Breaking through these barriers at various points, some of the larger rivers have repeatedly changed their courses, and now wind their way, among the irregular breaches thus effected by their swollen spring-torrents, to the lake. Another class of formations with which the settlers on the shores of the great lakes are familiar, are the "hooks" and "spits"

formed by the waves and currents under the action of winds in certain prevailing directions. The peninsula, or island, enclosing Toronto Bay, which determined the site of the chief city and harbour of Upper Canada, is an example of the latter class. The more remarkable site of Superior City has been formed by a combination of the two formations on an unusually gigantic scale. At the extreme western point of Lake Superior the northern and southern shores meet in the Fond du Lac; within which the swollen spring and autumnal torrents of the Nemadji and the Aloues rivers combine with the greater volume of the St. Louis to build up with their annual deposits the remarkable system of spits and river-belts referred to. From the converging shores of the lake two long and narrow tongues of land project towards each other, enclosing an area nearly ten miles in length, and leaving between their extreme points only a narrow channel for the exit of the waters of a vast territory, drained by the rivers that empty themselves into this bay. One of the river-formations, already marked off for wharf and warehouse lots by the far-sighted city speculators, forms an irregular projection from the western bank of the Nemadji far across the bay of Superior, and detaching its western portion, which has received the separate name of Aloues Bay. The large estuary of the St. Louis, again, is fenced off by inner peninsular spits and river-belts of great extent. All, indeed, is on a scale of magnitude far surpassing anything to be met with elsewhere along the shores of the great lakes; and in some of its features is rather to be compared with such oceanic structures as those which, through long centuries, the Atlantic currents built up on the New England coast, that they might at length shelter the little "Mayflower" with its precious seeds of empire.

Here, at the mouth of the Nemadji River, is the site of the future city. Already the axe of the pioneer is levelling the forest, and clearing out its destined thoroughfares; while plans have been matured and are in progress for making it the starting-point of a railway to the Mississippi, where it rolls its mighty volume of waters uninterruptedly to the Gulf of Florida. The scheme cannot fail; for it is only restoring, with all the added facilities which civilisation brings in its train, the ancient route by which, as will be seen, the metallic treasures of Lake Superior were distributed of old through the vast regions watered by the Mississippi and its tributaries; and the gigantic tropical shells, and other rare products of southern latitudes, were transferred to the shores of the great northern lakes. It is impossible to look with indifference on such an initial stage of one of the great revolutions begot by civilisation amid the western wilds. We can only guess at the beginnings of ancient cities and empires; but here we are present at the actual birth, and look on the first clearings, the rude shanty, the temporary pier and corduroy road for the city in embryo, destined to be what Chichago has proved for Lake Michigan, perchance what St. Petersburg has been for the Neva and the Baltic, or Alexandria once was, and may yet again be, for the Nile.

Viewed in this light, the remarkable features of Superior Bay and its tributary rivers possessed a peculiar charm, thus seen, as it were, at the close of one great cycle of their history, in their natural state, the gradual formation of ages, and all untouched by the hand of man. The frail village of wigwams and the tiny fleet of birch-bark canoes, only added a characteristic feature to the wild face of nature. In this, as in so many other respects, no more striking contrast could be presented to the ancient historic rivers of Europe, with their dykes,

and piers, and breakwaters, the monuments of enterprise and engineering skill: pertaining, like the dykes of the Essex marshes on Old Father Thames, to a date nearly coeval with the Christian era; or reaching back, like those of the Delta of the African Nile, to the birth-time of history and the infancy of the human race. The contrast between the new and the old here is sufficiently striking; yet the old also was once new; had even such beginnings as this; and was as devoid of history as the rawest clearing of the Far West. Guided by the disclosures of a New World just entering on the dawn of its historic life, may we not hope to read more clearly the traditions of ancient primitive history, and to recover new light wherewith to illuminate the Old World's prehistoric times?

CHAPTER III.

THE PRIMEVAL OCCUPATION: SPEECH.

ON the busy scene of the Western Canadian capital, little more than half a century ago, stood, as we have seen, the primitive wigwams of the Red Man, in a state of nature; and the primeval forest swept like a leafy sea back from the shores of the great lakes to the Arctic circle. At times a little more remote, within the last three centuries, the same was the case on every civic site of the New World. We call the forest primeval, and we speak of the savage as the child of nature. But we do neither in any very strict or scientific sense. What, indeed, is the natural condition of man, is even now by no means a settled point. Nevertheless we have very varied sources to which we may turn for a reply. Without looking for systems of science in the Bible, which it was never designed to furnish, either in relation to the organic or inorganic world, or to man himself: we nevertheless derive from thence incidental notices of the highest value in reference to the suggested inquiry. The geologist may turn aside from the Mosaic record as a book never designed for his aid, but the ethnologist cannot do so, unless he is prepared entirely to reject its authority; for man is its theme, and the earth's creation is only considered there in so far as it relates to him. Moreover, there, and there only, can he turn for any authoritative information relative to the origin of

our race. If that is rejected, there remains for us only the vague inductions of science on a point beyond its ken; or the childish fables of tradition, in which the intellectual Greek and the untutored savage are on a par. There, then, we learn, in the one written record possessed of the slightest value, of man primeval as no savage, but a being of intellectual power and moral purity; and all other records of later origin seem to point towards the same eastern area, there indicated as the cradle of the world's civilisation, and the birthplace of the nations. But, also, the further our investigations are pursued, the more evidence do we find, tending to confirm our belief in certain analogies between the modern savage, conventionally designated the child of nature, and primeval man. "Geology is the archæology of the globe; ethnology that of its human inhabitants;"[1] and the more closely the two have been brought in contact, the more clearly does it seem to be forced on our acceptance, that the primitive condition of man included none of those physical appliances of inventive skill indissolubly associated with all our modern ideas of civilisation and intellectual progress.

The investigation of the underlying chronicles of Europe's most ancient human history, have placed beyond question that its historic period was preceded by an unhistoric one of long duration, marked by a slow progression from arts of the most primitive kind to others which involved the germs of all later developments. From Europe, and the historic lands of Asia and the Nile Valley, we derive all our ideas of man; and of the youngest of these continents, on which he has thus advanced from savage artlessness to the highest arts of civilisation, we have history, written or tradi-

[1] Prichard, "Anniversary Address before the Ethnological Society of London." 1847.

tional, for at least 2000 years. But in the year 1492, a New World was discovered, peopled with its own millions, for the most part in no degree advanced beyond that primeval starting-point which lies far behind Europe's oldest traditions. The significance of such a state of things is worth inquiring into, if it be for nothing else than the light which the analogies of such a living present may throw on that curious infancy of Europe's ancient past; and beyond that, on the primal infancy of the human race.

Recent discoveries of rude traces of primeval art in the diluvial formations both of France and England, have tended to add a fresh interest to the investigation of that "primeval stone-period" which underlies the most ancient memorials of Europe's civilisation. We know from that oldest of all written chronicles, the first book of the Mosaic pentateuch, that there existed a period of some duration in the history of the human race, during which man tilled the ground, pursued the chase, and made garments of its spoils, without any knowledge of the working in metals, on which the simplest of all our known arts depend. Through such a stage of primitive art, it had already appeared to me most probable, that all civilized nations had passed; before those disclosures of a human stone-period in the chroniclings of the drift added new and seemingly indisputable confirmation of the term *primeval*, in its application to the non-metallurgic era of Britain's and Europe's arts.

The incredulity and even contempt with which the applications of a system of archæological periods to the antiquities of Britain was received, a few years ago, by a certain class of critics, was inevitable, from the almost exclusive attention previously devoted to Roman and mediæval remains. "When will Druidical archæologists

be convinced," exclaims the black-letter antiquary, "that menzhir and peul-ven, cromlech and kistvaen, tell us nothing; and from nothing nothing comes. You can no more judge of their age, than the eye can estimate the height of the clouds. These shapeless masses impart but one lesson, the impossibility of recovering by induction any knowledge of the speechless past. Waste not your oil. Give it up, that speechless past; whether fact or chronology, doctrine or mythology; whether in Europe, Asia, Africa, or America; at Thebes or Palenque, on Lycian shore or Salisbury plain: lost is lost; gone is gone for ever."[1] So exclaims the enthusiastic black-letter scholar, in words alike daunting to geologist and archæologist: while himself patiently expending his oil in the laborious effort to recover some chance grains of historical truth from the credulous but courtierly chroniclings of Dudon de Saint-Quentin; or from such tardy miscellanies of younger tradition as served to beguile the tedium of St. Evroul's cloisters to that gentle, but most uncritical of monkish penmen, Ordericus Vitalis. Cromlech and kistvaen have already disclosed to us the physical characteristics and the primitive arts of Europe's allophylian races, in ages long prior to letters. We may, at times, misread their chroniclings, but they never wilfully mislead, never blunder, never whisper flattery over the dead whose memory they have in trust; and that is more than can be said of Dudon de Saint-Quentin, or any monkish chronicler.

The Roman antiquary has next his fling at the systematizing of primitive archæological explorations and inductions, as an attempt "specious and attractive in appearance, but without foundation in truth." "Such," accordingly proceeds the explorer of Roman Britain; "such, I am convinced, is the system of archæological

[1] Palgrave's *History of Normandy*, vol. i. p. 469.

periods which has been adopted by the antiquaries of the North, and which a vain attempt has been made to introduce into this country. There is something we may perhaps say poetical, certainly imaginative, in talking of an age of stone, or an age of bronze, or an age of iron; but such divisions have no meaning in history, which cannot be treated as a physical science, and its objects arranged in genera and species. We have to do with races of mankind, and we can only arrange the objects which come under our examination according to the peoples to whom they belonged, and as they illustrate their manners and history. In fact, the divisions alluded to are themselves incorrect, and so far is the discovery of implements of stone, or of bronze, or of iron, from being proof of any particular age, that we often find them together."[1] So says the Roman antiquary, adding in explanation of such a condition of things that, "in the *early period* to which the volume refers, intercommunication was slow and difficult. . . . It was then necessary to use such materials as came to hand, and there is no possible reason why one man should not possess a weapon or a tool formed of stone, while his richer or more fortunate contemporary had one of iron or bronze;" all which only serves to prove the difficulty of persuading the classic antiquary how very modern a thing that Roman world was with which alone he is disposed to deal. That which he here calls "the early period," refers, at the earliest, to the century before the Christian era; for the most part the materials for its illustration, which Britain supplies, belong, like those of Herculaneum and Pompeii, to the younger era, and even to dates two or three centuries later. Instead of being an early period in the history of man, it is not even an early period in that of Rome. It belongs rather to what

[1] *The Celt, the Roman, and the Saxon*, pp. vi. vii.

St. Paul expressively styled "these last days." The whole national history of Greece was already completed, and among the things of former generations; the elder eastern monarchies were in being two thousand years before, and the world had been the arena of human history, according to the lowest computation, for upwards of four thousand years.

It is no disparagement of the labours of the classic antiquary to remind him that there were heroes even before Agamemnon. The researches alike of the Roman and mediæval archæologist are replete with value, supplementing history in a thousand ways, and throwing light on many puzzling obscurities and errors; but where either attempts, from his own recent point of view, to challenge that remoter past which the archæologist is striving in some faint degree to elucidate, it might not be unmeet to recall the terms of Horace Smith's quaint address to Belzoni's mummy,—no antediluvian patriarch, but a mere Theban of the Nile, who may have dropped an obolus when Homer sung:—

> "I need not ask thee if that hand, when armed,
> Has any Roman soldier mauled or knuckled,
> For thou wert dead, and buried, and embalmed
> Ere Romulus and Remus had been suckled;
> Antiquity appears to have begun
> Long after thy primeval race was run!"

But the attention of the antiquary, as well as the geologist, is now being directed to the inevitable conclusions forced on both by the discoveries of the rudely fashioned flint hatchet and spear-head in the stratified gravel of post-pliocene formations. Of the artificial origin of these it seems no longer possible to doubt, and the circumstances attending their repeated discovery seem equally to place their remote antiquity beyond question. Sir Charles Lyell has cautiously summed up

the evidence in a manner singularly applicable to our present purpose, when referring to the fossil implements and weapons of Abbeville and Amiens. "Although the accompanying shells are of living species," he observes in his address from the chair of the Geological Section of the British Association, "I believe the antiquity of the Abbeville and Amiens flint instruments to be great indeed, if compared to the times of history or tradition. I consider the gravel to be of fluviatile origin, but I could detect nothing in the structure of its several parts indicating cataclysmal action; nothing that might not be due to such river-floods as we have witnessed in Scotland during the last half century. It must have required a long period for the wearing down of the chalk which supplied the broken flints for the formation of so much gravel at various heights, sometimes one hundred feet above the present level of the Somme, for the deposition of fine sediment, including entire shells, both terrestrial and aquatic, and also for the denudation which the entire mass of stratified drift has undergone: portions having been swept away, so that what remains of it often terminates abruptly in old river cliffs, besides being covered by a newer unstratified drift. To explain these changes, I should infer considerable oscillations in the level of the land in that part of France; slow movements of upheaval and subsidence, deranging, but not wholly displacing, the course of the ancient river. Lastly, the disappearance of the elephant, rhinoceros, and other genera of quadrupeds now foreign to Europe, implies, in like manner, a vast lapse of ages, separating the era in which the fossil implements were framed and that of the invasion of Gaul by the Romans."

Subsequent investigation by experienced geologists has somewhat modified the ideas here expressed. Prof.

J. S. Henslow, after minute observations, comes to the conclusion that "no one can doubt the evidence to be in favour of a cataclysmic action, and rapid deposition of the lower and larger portion of the gravel, at the spot near St. Acheul where the hatchets occur." Neither does he suppose that the facts witnessed by him, indicate of necessity that the bones of extinct mammals found alongside of the flint implements were contemporary with the unskilled workmen by whom these were wrought; or that the evidence carries man altogether out of the range of human history. The fossil bones and the human implements are mingled in a gravel, formed as a redisposition by fresh-water agency, out of older materials probably belonging to very different periods, though the most modern of them undoubtedly pertain to a period long prior to the oldest dates of Gaulish history.[1] The most improbable feature about this discovery of traces of human art in the drift has been the number of specimens found within so limited an area, in complete contradiction to the experience of archæologists, with reference to more recent deposits. But the incredulous wonder with which one reads that "it is estimated that the total number of worked flints exhumed by their eminent discoverer, M. Boucher de Perthes, of Abbeville, exceeds 1500, and may even approach 2000 specimens," is considerably lessened by an examination of the numerous plates illustrating these discoveries, in the "Antiquités Celtiques et Antédiluviennes." Certainly ninety per cent. appear to the ordinary eye mere flint chips such as may be gathered from any gravel heap. But after rejecting every doubtful specimen there still remain indisputable evidences of human art, startling us with the remote antiquity to which, on any system of interpretation, we must refer

[1] *Athenæum*, Oct. 20, 1860.

such traces of the presence of man in the north of Europe.

Yet, after all, this is only an old truth confirmed by additional proofs. Precisely similar evidences of oscillation, upheaval, and derangement of the course of ancient rivers had accompanied the attempts to illustrate a primeval British stone-period before the discoveries of Abbeville and Amiens were heard of.[1] In the year 1819 there was disclosed in the alluvium of the carse-land, where the river Forth winds its circuitous course through ancient historic scenes already referred to, the skeleton of a gigantic whale, with a perforated lance or harpoon of deer's horn beside it. They lay together near the base of Dunmyat, one of the Ochil Hills, and twenty feet above the highest tide of the neighbouring estuary. Over this was an accumulation of five feet of alluvial soil, covered with a thin bed of moss. The locality was examined at the time, and the levels noted by scientific observers peculiarly competent to the task; and at the same time sufficient traces of the old Roman causeway were observed, leading to one of the fords of the Forth, to prove that no important change had taken place on the bed of the river, or the general level of the strath, during the era of authentic history.[2] Nor was the example a solitary one; remains of those gigantic Balænæ have been repeatedly found; and one skeleton discovered in 1824, seven miles further inland than the earlier example, now lies in the Natural History Museum of Edinburgh University, along with the primitive harpoon of deer's horn found beside it.

With such well-authenticated and altogether indisputable evidence already in our possession, what addition is made to our grounds for belief in the antiquity

[1] *Prehistoric Annals of Scotland*, p. 33.

[2] *Edinburgh Philosophical Journal*, vol. i. p. 395.

of the prehistoric human era of Britain or Europe? Whatever difficulties may seem to arise from the discoveries at Abbeville and Amiens, or the older ones at Hoxne in Suffolk, in relation to the age of man, the chronology which suffices to embrace the ancient Caledonian whaler within the period of human history will equally answer for the more recently discovered allophylian arts of the French diluvium. And lying, as the Scottish relics did, almost beneath the paving of the Roman causeway: what, it may fairly be asked, have the discoveries of the Roman antiquary relative to the British Celt of Julius Cæsar's time, or to the Romanized Britain of Claudius or Nero, to do with an archæological period to which the Dunmyat and Blair-Drummond Moss harpoons belong? They have somewhat less to do with it than the American aborigines of the fifteenth century have to do with the primeval race and period of the New World; for Celtic Britain, though insular, had been subject to no such isolation as the American Continent. The very question raised anew by the critical examination of such disclosures as the British drift, ossiferous caves, gravel mounds, and chance deposits reveal, is whether the ancient British Celt, on whom Roman and Saxon intruded, was not himself an intruder on older allophylian occupants?[1] If he was not, we must ascribe to the language and race of the Celtic Briton an antiquity without a parallel in the history of nations; for when the Roman intruded on his insular home it was at the close of an epoch which had witnessed such protracted changes as those that elevated the ancient estuary of the Forth from the ocean-bed, and buried its giant mammals beneath an accumulation of

[1] This question was first brought forward by the author in an *Inquiry into the Evidence of the Existence of Primitive Races in Scotland prior to the Celtic.*—*British Association Report*, 1850.

alluvial soil and peat moss, which had spread the broad carse along the base of the Ochils at the same level as now, before Agricola, in the first century of our era, led his Roman legions against the northern Caledonians. To the mediæval or the Roman antiquary, such traces of primeval man may be of no account, but to the ethnologist they are of the profoundest interest and value.

There is a certain remote epoch in most men's ideas of the past, by no means uniformly defined, beyond which all becomes vague antiquity, and whatever it may disclose is assumed to have been contemporaneous; just as the Indian of Central America is content to ascribe its ruins to the *antiguos*, and the old geologist referred all organic remains to the Deluge. But this, which was inevitable at an earlier stage of inquiry, when all our means for the recovery of a knowledge of the past history of man seemed exhausted, will resolve itself into a definite recognition of relative antiquity, in no degree calculated to diminish the just estimation of those more modern researches of the Roman or mediæval antiquary which are essential to the completeness of the whole. Each new accession of evidence seems to confirm the probability that all tribes and nations of the human family have passed through the same preliminary and infantile stage of arts; and at a period when the exploded theory of man's development from some inferior organized type seems to be revived with renewed favour, whatever tends to harmonize our ideas of primeval man as disclosed to us in the records of nature and revelation, is worthy of the most earnest study. But in this as in so many other branches of scientific inquiry, the premature efforts to harmonize the first vague glimpses of a half-seen revelation of science with preconceived interpretations of the sacred cosmogony, threaten to retard the

inevitable discovery of scientific truths which, when fully known and appreciated, cannot fail to harmonize with all other truths, and even to throw new light upon them. One such investigator of the traces of art in the superficial drift, in his anxiety lest any modification of the popular opinion of the recentness of man's introduction on the earth should seem to conflict with the truths of sacred Scripture relative to his creation, exclaims :— "We have more positive evidence that his first appearance was characterized by many proofs of high intellectual condition which our sacred beliefs attach to his origin, and that he was not primarily the ignoble creature that arrow-heads and flint-knives, and ossiferous caverns would so lamentably indicate. The mighty ruins spread over the plains and great river water-sheds of the East clearly indicate his Oriental cradle-land, when, in conjunction with the traditions of all nations in the most remote times, he dwelt in palaces, luxuriated in gardens, worshipped in temples of solemn grandeur, and reared towers and pyramids enduring as the rocks from which they were hewn. The arts and sciences and commerce accompanied the progress of his terrestrial occupation, bringing in their train the elegancies, luxuries, and perfected implements of defence or attack which the highest stages of civilisation imply."[1] Such arguments—advanced not in a mere popular lecture, but submitted to the section of the British Association to which Lyell had communicated the observations and results of himself and other well-qualified investigators on the same profoundly interesting and important inquiry,—are urged as something more significant than a mere rhetorical generalization. Yet their author was well aware that neither Botta, Layard, Rawlinson, nor

[1] Rev. John Anderson, D.D. "The Geologic Age of Man in its Present Aspects," *Athenæum*, Oct. 1, 1859.

any other explorer of the mighty ruins of the East, pretends to have discovered the works of antediluvian builders, or even the ruins of very early postdiluvian generations. The Mosaic narrative, instead of justifying any such statements as to the intellectual proofs that characterized man's appearance on earth, tells us explicitly of the first beginning of kingdoms by the nomade hunter, Nimrod, at the very lowest computation nearly two thousand years: or, according to others, still regarded as probably erring in deficiency rather than excess, more nearly four thousand years after the creation of man. The world's early historic chronology has yet to be revised; but meanwhile such arguments retard science, while they do a greater wrong to revealed truth: marshalling the loyal defenders of the sacredness of the Scriptures, in defence of human interpretations, as worthy of such misguided loyalty as the zeal of the Roman Inquisition on behalf of the Ptolemaic system and orthodox astronomy, in its crusade against Galileo and the Copernicans of the seventeenth century. What then are the intellectual conditions pertaining to primeval man, in so far as we can deduce them from the joint records of science and revealed truth?

The whole reasoning alike of the antiquary and the theologian against the characteristics which archæological discoveries tend to assign to man in his primeval condition, originates in an illogical association of the concomitants of modern intellectual and social progress with the indispensable requisites of man's primary condition as created in the Divine image, a being of intellectual and moral purity. It is not necessary for the confirmation of a primeval stone-period for man, that we degrade him from that majestic genesis of our race, when he heard the voice of the Lord God amongst the trees of Paradise and was not afraid. Still less is it requisite

that we make of him that "extinct species of anthropoid animal" hastily invented by over-sensitive Mosaic geologists to meet the problematic case of pleistocene products of art. In that primeval transition of the ethnologist in which geology draws to a close and archæology has its beginning, when the old orders of organic life were disappearing, to make way for a new and far higher order of beings: amid strange beasts of the earth, cattle, and creeping things, we discern

> "Two of far nobler shape, erect and tall,
> Godlike erect, with native honour clad
> In naked majesty, seem'd lords of all;
> And worthy seem'd: for in their looks divine
> The image of their glorious Maker shone,
> Truth, wisdom, sanctitude, severe and pure,
> Severe, but in true filial freedom placed;
> Whence true authority in men."

But if our modern technological standards are to be the only received tests of intellectual nobility, "his fair large front and eye sublime," with all the grand suggestive picturings of Milton's primeval man, are vain. His arts, though ample enough for all his wants, by such modern standards declare him no better than "the ignoble creature that arrow-heads and flint knives would indicate." He needed no weapons for war or the chase; implements of husbandry were scarcely more superfluous, amid a profusion far ampler than the luxuriant plenty of the islands of the Southern Ocean. The needle and the loom were as foreign to his wants as the printing-press or the electric telegraph. What did he want with the potter's wheel, or the sculptor's chisel, or the mason's tools? And if his simple wants did suggest the need of some cutting implements, the flint knives, or

> "Such other gardening tools as art, yet rude,
> Guiltless of fire, had formed,"

harmonize with the simplicity of that primeval life, and its easy toils, far more naturally than the most artistic Sheffield cutlery could do, with all its requisite preliminary processes of mining, smelting, forging, grinding, and hafting the needless tool.

The idea which associates man's intellectual elevation with the accompaniments of mechanical skill, as though they stood somehow in the relation of cause and effect; and with the intellectual as the offspring, instead of the parent of the mechanical element: is the product of modern thought. The very element which begets the unintellectual condition of the ignoble savage is that his whole energies are expended, and all his thoughts are absorbed, in providing daily food and clothing, and the requisite tools by which those are to be secured; or where, as in the luxuriant islands of Polynesia, nature seems to provide all things to his hand, his degraded moral nature unparadises the Eden of the bread-fruit tree. Reasoning without any aid from revelation, it seems difficult to conceive of man primeval as a being starting into existence with artificial wants supplied by fictile, plastic, and metallurgic arts. Looking on him merely from the palæontologist's point of view, we should be more apt to conceive of him as the infantile Hesiodic savage, for whom the Titan Prometheus compassionatingly sinned the sin of Lucifer, that he might teach him mechanical inventions, and the obedient service of fire. But the true primeval man, clothed in his own innocence, and eating "angel's food," derived his moral and intellectual nobility from far different characteristics than those of the classical proto-metallurgists, Hephæstos or Vulcan. In such a condition of moral purity and freedom, a Socrates or Plato, a Bacon or Newton, might have wrought out their grandest problems.

The sacred narrative is singularly minute in its record

of the introduction of the metallurgic arts to the human race, doubtless in full recognition of the mighty revolutions to be wrought by their means. Such is the brevity of the whole antediluvian record that it may be doubted if many have reflected on the great lapse of time that intervened between the creation of man and his introduction to a knowledge of metallurgy. It is not until towards the close of the antediluvian era, fully a thousand years after the expulsion from paradise, that Zillah bare unto Lamech, Tubal-Cain, the instructor of every artificer in brass and iron. It might seem from the tragic song of Lamech—that most ancient of all human lyrics,—which immediately follows, as if the first use of the newly-discovered art had been for homicide. The newly-created man had other ends to accomplish for himself and his race, than those which seem so pre-eminently essential in this era of such wonderful mechanical triumphs. When at length the mechanical skill of the first great ship-builder was called into requisition, it was not for the development of maritime enterprise and discovery, or the creation of a world-wide commerce: but because God looked on the earth, and it repented him that he had made man, and he said to Noah, "The end of all flesh is come before me; for the earth is filled with violence through them, and behold I will destroy them from the earth."

"And the whole earth was of one language, and of one speech;" but what was the language and speech of man at the beginning of that previous non-mechanical epoch? The development of speech into language was, I conceive, a fitter and more needful occupation for primeval man, than anticipating the wants of remote generations by a premature birth of mechanical arts, as superfluous to him as the luxuries of modern fashionable life. In reopening the question of the origin of lan-

guage, I am well aware that I deal here, once more, with a question which has found its solution in hypotheses and deductions ranging through the widest conceivable extremes. Nevertheless the remarkable phenomena connected with the languages of the New World, the elaborate and highly complex grammatical structure of the speech of savage tribes, devoid of letters, or any trace of past or present civilisation; and even the very existence of language, and its extremely diversified subdivisions and peculiar forms as met with on the Western Continent: all combine to present this subject in novel aspects, not without their value as helps towards the solution of a problem so. profound as the origin of language.

Was language then, like the living soul, a divine gift to the first man, and therefore created a mature and self-consistent whole: latent, but ready without effort for every new occasion of speech? Or was man simply indued with organs of speech, and with an innate perception of relations between specific ideas and articulate sounds, and thus left, with his mature intellectual powers, to create words as he stood in need of them? The answer seems even more explicitly provided to these questions than to that of the origin of metallurgic arts. The first evidence we have of the existence and use of human speech is derived from the exceedingly simple, yet suggestive narrative which immediately follows the genesis of man: "And out of the ground the Lord God formed every beast of the field, and every fowl of the air, and brought them unto Adam, to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof. And Adam gave names to all cattle, and to the fowl of the air, and to every beast of the field; but for Adam there was not found an help meet for him." He was, therefore, alone,

without need of speech for the interchange of thoughts, and devoid as yet of a companion with whom he could hold intelligent converse.

The sacred narrative fully accords, in its description of the first use of speech, with all experience as to the primary elements, and the indigenous or purely native portions of language. Among these will certainly be found the names of the most familiar fauna and flora pertaining to the habitat of the race speaking the language. Abstract or generic terms, like the class of ideas they express, are of late growth in every language; and in our own are chiefly borrowed from foreign tongues. The names of individual animals are needed before any want of the generic word, *animal*, is felt. Even the abstract idea of number is difficult to be conceived by the uncultured mind, apart from specific objects enumerated; nor does the mind necessarily perceive any common relation between forms, colours, odours, or other qualities of objects, noted only for their diversity; so that even the Anglo-Saxon, after providing an ample native vocabulary for the reds, blues, blacks, browns, and whites, familiar to his eye by their differences, has at length to borrow the Latin *color*, when he makes the tardy discovery of their common relation; as he takes from the same foreign source that of *crime* as the generic term for the crimes with which his own vocabulary is replete. This absence of such abstract terms, common to all primitive stages of language, is as singularly characteristic of the American Indian vocabularies, as of the undeveloped and unprogressive Indian mind. In this view of language, the first recorded use of speech, in the naming of the living creatures, is full of significance, and strikingly contrasts with the Miltonic dialogues of our great English epic, between Raphael and Adam. A single example will suffice, where the arch-

angel describes to the first man the Satanic artillery, by the help of similes derived from modern architecture,

> "Which to our eyes discovered, new and strange,
> A triple-mounted row of pillars, laid
> On wheels; for like to pillars most they seemed."

The poet's fancy of the invention of cannon, gunpowder, balls, and bombshells, by rebel hosts of angelic combatants, ere our terrestrial planet was evoked from chaos, is not more extravagant than the idea that the speech of primeval man embraced in its vocabulary such words as *wheels, pillars,* and all other terms of mechanical, artistic, and scientific discovery and invention of later times.

In the slow migrations of the human family from its great central hives, language imperceptibly adapted itself to the novel acquirements of man. But with the discovery of America a new era began in the history of migration and all its attendant phenomena. Suddenly, in the maturity of Europe's fifteenth century, another world burst upon it, and the nations hastened to possess themselves of the land. But in its novel scenes language was at fault. Beast, bird, and fish; flower and tree; art, nature, and man himself, were all strange; and it seemed as if language had its work to do anew, as when first framed amid the life of Eden. The same has been the experience of every new band of invading colonists; and it can scarcely fail to strike the European naturalist on his first arrival in the New World, that its English settlers, after occupying the continent for upwards of three centuries, instead of originating root-words wherewith to designate plants and animals, as new to them as the nameless living creatures were to Adam in Paradise: apply in an irregular and unscientific manner, the old names of British and European

fauna and flora. Thus the name of the English partridge (*Perdicidæ*) is applied to one American tetranoid (*Tetrao umbellus*), the pheasant (*Phasianidæ*) to another, *Tetrao cupido;* and that of our familiar British warbler, the robin, to the *Turdus migratorius*, a totally different American thrush. It is only in a few instances that anything like a distinct popular nomenclature has been attempted, as in the designation of the cat bird, the mocking-bird, the blue-bird, or the snow-bird; while in other cases the native Indian name has been borrowed.

This belongs, in part, to the condition of vitality manifested by languages at a late stage of development, when the power of originating primary radicals has long been dormant. But it also leads to other ethnological inquiries, in reference to all names of animals, to which we shall recur at a later stage. This much, however, may be noted meanwhile, that looking to names of the most familiar animals and plants, as they occur in languages of the Indo-European or Semitic stock, each nation appears to have native etymons for such, only in so far as they were themselves native to the original habitat of the race; and thus there are, to a certain extent, philological centres of creation, coincident with the supposed zoological ones; though these greatly vary in their compass. The beaver, for example, though now seemingly hastening to extinction alike in the Old World and the New, has once been a very widely diffused native, as its remains prove; and this the philological indications of its name confirm, *e.g.*, Sanscrit, *babhru*, in all probability an onomatopœic root-word of the class referred to hereafter, derived from a cry of the animal. In the Pehlevi branch of the Persian it becomes *baovara;* Sclavonic, *baber*, and *bobr;* Lithuanic, *bebru*, *bebris;* Icelandic, *bifr;* Danish, *bæver;* Swedish, *bäfver;*

German, *biber*; Anglo-Saxon, *befor*, *boefer*. The transposed Latin form, *fiber*, returns in the Italian to *bevero*; Spanish, *bibaro*; French, *bièvre*. The totally diverse κάστωρ of the Greeks, is a remarkable exception to this general uniformity. Again the Welsh has its own independent *avangk*, which, as pronounced, bears a sufficient resemblance to the Chippewa *ahmeck*, and the Odahwah *ahmik*, to suggest the same origin: not from any ancient root-word common to British Celt and American Indian, but independently borrowed from the animal's own cry. The Irish, again, has its doubly-derived *beavar* and *kastar*; but all the Celts of the British Isles, Welsh, Gaelic, and Erse, agreed in a preference for a descriptive term suggestive of little familiarity with the animal in its native haunts. Welsh, *Llosthlydan*; Gaelic, *dobhran leas-leathan*; and Erse, *davaron-lois-leathan*, the broad-tailed otter.

In every great migration, or abrupt transition from one country to another and diverse one, the emigrant is placed once more in relation to the nomenclature of its strange fauna and flora, in a position analogous to that in which we recognise the first origin of speech. But both the language which he uses, and the intellectual faculties employing it, are in a totally different condition from those in which the linguistic instincts of man first gave form and utterance to language. As languages in a late stage give birth to few root-words, so nations do not as a rule, create original names for foreign animals or plants, and no voyager or colonist is found to have invented them even for such strange objects as the ornithorhynchus of New Holland, or the orycteropus of the Cape. They either apply to them such modifications of a native term as suffice to express certain fancied analogies; or more rarely they borrow the unfamiliar foreign name, as alone applicable to the

unfamiliar object. Hence the strange quadruped to which Blumenbach gave the name of *Ornithorhynchus*, is the mallangong and the tambreet of the natives of New South Wales, while it is the duck-billed platypus of Dr. Shaw, and the water-mole of the English colonists. So also the *Orycteropus Capensis* is the goup of the Hottentot, and the innagu of the Caffre, while it is the aard-vark, or earth-pig of the Dutch boer and the English settler of the Cape of Good Hope.

But one remarkable class of exceptions to this law of language in its later stage of growth, finds illustration in certain names of the fauna of new countries, the etymologies of which are clearly traceable to onomatopœia, as in the suggested origin of the beaver's name. In this nearest approximation to verbal creations, the colonist of the New World carries us back to the very foundations of language, and helps to solve one of the profoundest problems in philology. The simplest of such names are mere mimetic voice-descriptions; but they recal to us that natural significance of sound which seems to lie at the foundation of all primary intelligent speech. Articulate sounds have, within a certain range, an inevitable association with certain specific ideas. In the complicated structure of modern languages, the natural significance of articulate sounds has been so overlaid with the artificial growth of later times, that it can only be detected in fragments. Yet all languages have their onomatopœic terms, and a certain adaptation of sound to sense and association. The word *thunder*, like its equivalents in other languages, had its origin in the idea of the sound, the monosyllable *light* in that of its appearance; and the mimetic sound is present in a thousand words describing sensible objects, operations, and cries. *Clash, whet, cut, grunt, buzz, snore, cough, squeak, laugh, screech, scream,*

cry, roar, etc., all have a significance, which in the infancy of language must have been traceable over a large portion of the vocabulary, and seems to lie at the very root of the distinction between the vocal utterances of the lower animals, and the intelligent speech of man. Even now it pervades the most refined and artificial languages, like our own highly complex and composite English; so that the nice discrimination of the true orator manifests itself in part in the choice of words harmonious to his thoughts, and the law of the poet is universally recognised:—

> "'Tis not enough no harshness gives offence,
> The sound must seem an echo to the sense."[1]

By the simplest adaptation of this imitative association of ideas, the European settlers in the New World have added to the stock of root-words. Thus the sloths of South America (*Bradypus communis*, and *Bradypus collaris*), have received from the Spaniard the name of ai, in imitation of the plaintive cry they emit when in motion in the forests. So also the Brazilian eagle (*Polyborus vulgaris*), is called the caracara, from its hoarse, peculiar utterance; and the boruardi, or large toucan (*Ramphastos toco*), is the piapoco wherever its voice has rendered that sound familiar. The whip-poor-will (*Camprimulgus vociferus*) is heard very distinctly, in the Canadian and American forests, to utter throughout a whole summer's night the name by which it is designated. The pewee (*Musicapa rapax*), the towhee (*Emberiza erythroptera*), the kittawake (*Larus tridactylus*), and many other animals of the New World, have received local or generally accepted names, all clearly illustrative of words originating in the simplest primitive source of imitation.

[1] Pope's *Essay on Criticism*, l. 365.

Such is an interesting illustration of the natural growth of a vocabulary, consequent on migration, which the New World supplies; and in this direction we may look for one, at least, of the primitive sources of language. Descriptive names, such as may be represented for our present purpose by modern terms, like the turnstone, kingfisher, fly-catcher; or the white bear, red-poll, indigo bird, scarlet tanagee, or golden eagle; or, again, by the hairy woodpecker, passenger pigeon, trumpeter swan, or tell-tale tattler,—those, with corresponding names in any ancient or modern language, as in the Sanscrit, where they abound,—manifestly imply the previous existence of names of colour and metals, and the development of descriptive epithets of various kinds. In no sense can such names be regarded as primitives; but such was not the characteristic of the earliest animal names, as may perhaps be illustrated by the familiar word *lion*, common to nearly all the languages of Europe. It appears to be an onomatopœic primitive, whether we seek its earliest root-form in the Greek λέων, or elsewhere. The lion was a native of Macedonia within historic times, and therefore needed no borrowed name in a Pelasgic or Hellenic tongue. The word, though of independent origin, has the same natural derivation as our English *low*, A.-S. *hleowan*, the cry or bellowing (A.-S. *bellan*) of a cow, as in the Sanscrit *go*, an ox; and also our *halloo*, as well as the verb to hollo, A.-S. *ahlowan:* all imitations of natural sounds. Nor is our gain slight in such a process of analysis, when we thus trace a word to a simple natural origin. It is the only finality that is entirely satisfactory in etymology; contrasting in this respect with many a derivation hunted through English, Anglo-Saxon, and all intermediate stages, to a supposed Sanscrit root, still as arbitrary to us as the latest form with its associated significance. Such pure root-words, more-

over, are formed like primitive points of crystallization in language; for the capacity of a living language of multiplying offshoots of the simplest roots is incalculable. Take, as an example, the hawk, A.-S. *hafoc:* its name has a common origin with havoc, a cry of encouragement to capture and slaughter; it is related to our primitive auxiliary verb *have*, A.-S. *habban*, to have, to hold; to haft, a handle, that by which a thing is held; and hence, in A.-S. *hæft*, one held, *i.e.*, a captive, a slave. As still used in the south of Scotland, a *haft* is a dwelling; *to haft*, to settle in a dwelling, as in another sense we still use a *holding*, a *hold*, a *stronghold*. Hence, also, a *haven*, A.-S. *hæfen*, from which we return to our original root-word, in its Anglo-Saxon equivalent of *hæfen-blæt*, literally, a haven-bleater, which was applied both to the sea-gull and the hawk. But the offshoots of this simple root-word have not yet been exhausted. The relation of *hebban*, to heave, elevate, or hold up, to the more primitive *habban*, to have, to hold, is not difficult to discern. From thence, by regular gradations of change, we trace our way to *heafig*, heavy, difficult to hold up; and so, tropically, *heaflic*, heavy, sorrowful; *heavignes*, sorrow; while in another direction the same *hebban*, to elevate, gives origin to *hefen*, the eaves or elevated part of a house, and, finally, to *heben*, *heofen*, *i.e.*, heaven, the highest; just as in Scotland the Danish *lofter* has been converted into the lift, *i.e.*, the sky, the visible heavens.

If the links in this chain are not forged by fancy, they serve as the clue to a range of etymological wanderings as widely contrasting the opening with the close, as those through which the great Italian ranges in the visions of his *Divine Comedy*, and ending as if, madder than Hamlet, we did not "know a hawk from a handsaw" (*i.e.*, *hernshaw*, a heron); for the hawking cry with

which we set out is unquestionably the same which Antony introduces in his apostrophe to the "bleeding piece of earth," when he exclaims :—

> "And Cæsar's spirit, ranging for revenge,
> With Ate by his side, come hot from hell,
> Shall in these confines, with a monarch's voice,
> Cry, *Havoc!* and let slip the dogs of war."

Returning from this illustrative digression, and the reflections which the primitive λέων has suggested : with slightly varying forms, the same word belongs to the oldest and most modern of the European languages, and has supplied to our own such tropical offshoots as *leonine*, *lionize*, and *lions* of that modern breed for which Carlyle suggests that, "in such *lion-soirées*, might not each lion be ticketed, as wine-decanters are?" But the lion was also native to the area of the Semitic languages, and has its separate names, as though it had become known to them apart from those Eastern localities in which the Indo-European parent race and language had their origin. The Hebrew *aryeh* or *ari*, Syriac *aryo*, are descriptive, according to their derivation from the Hebrew verb, *arah*, to tear, to rend ; though this might seem a needless process of inversion, where the sound is not without its suggestive mimicry. But of the origin of the Coptic *mouee*, a lion, there can be no doubt. It is the same designation as has had its independent origin in the English nursery, from the lowing of a cow; and is indeed nearly the repetition of the mimetic λέων, with the labial instead of the dental. Traces of a similar independent origin of many words of the Coptic vocabulary are full of interest for us ; for some of these are recovered from the most ancient graven records on the monuments of Egypt. When Thoth, who was the god of letters, first appeared on the earth, there was a tradition, according to Plutarch, that the inhabitants of Egypt had no lan-

guage, but only uttered the cries of animals, until he taught them speech, as well as writing. The cry of the Egyptian ibis still repeats its ancient name of *hippep*. By some curious association of ideas, it furnished to the Egyptian the symbol of speech. Thoth, the god of letters, had the ibis for his sacred animal, and is represented as the ibis-headed deity; and from its name come the Coptic *hap*, judgment, *hōp*, to conceal, in reference to wisdom, secret or hidden knowledge. The illustrations of names imitating the cries of animals, which the language of ancient Egypt supplies, are equally numerous and striking. Take as examples: *mouee*, a lion; *e'he*, a cow; *htor*, a horse; *eoo*, an ass; *uhor*, a dog; *chaoo*, a cat; *rurr* and *eshau*, a pig; *phin*, a mouse; *croor*, a frog; *petepep*, a hoopoo; *meni*, a swallow; *djadj*, a sparrow; *hoff*, a serpent. Many other words expressive of actions or qualities had their origin in the Egyptian language by the same natural process of imitation, as: *owodjwedj*, to masticate; *thophtheph*, to spit; *omk*, to swallow; *kradjkradj*, to grind the teeth; *rodjredj*, to rub; *teltel*, to let water drip; *sensen*, to sound, etc.

Such illustrations are of peculiar interest to us, derived as they are from the language of the Egyptian monuments, and one of the most primitive of all known human tongues. They might be multiplied from many sources; and in the comparison of languages, the independent origin of words of closely corresponding sound and approximating significance, serves to illustrate how all language may have had its being. The Latin *tonitru* and *taurus* are both imitations of grave prolonged sounds, though the latter is derived and has its counterpart, whether independently or not, in various languages,—Greek, ταῦρος; Syriac, *tauro;* Chaldee, *tora;* Arabic, *taur*. The Sanscrit *çvan* may be assigned to a like origin, and thereby also its Latin form *canis*. So also, as we have

the primitive Sanscrit *ma*, for mother, Prescott remarks on the Mama Oello, or Eve of the Peruvians, among whom *mama* signified mother, *mamaconos* matron; as among the Greeks we find the corresponding *πάππα φίλε* of Nausikaa, in the *Odyssey*. Nor is the Peruvian *mama* a solitary example of the first simple word of the English nursery, independently employed in centuries and regions equally remote. Among the Tlatskani, an Athapascan tribe, *mama* signifies father, and *naa* mother; but in other languages the former retains the feminine signification. The Navajo, *mah* or *sho-mah*; the Weitspek, *mamus*; the Arapahoe, *nanah*; the Sioux, *enah*; Tuscarora, *ena*; Kenay, *anna*; Adahi, *amanie*; Guinau, *amma*; and the Esquimaux, *amama*, are all suggestive of the same primitive origin as the English *mamma*; for they are not mere dialectic changes of one root-word. The Guinaus are of South America, the Navajo Indians belong to New Mexico, the Sioux to the remote North-west, and the Esquimaux to the Arctic circle, while totally diverse vocabularies intervene. The natural connexions which the mind still perceives between certain sounds and sensations, were doubtless greatly more numerous in the earliest condition of language; and are more readily perceïved where man lives chiefly in direct connexion with the external world. Unimpressible as the Indians appear, I have been interested in observing that the interjectional value of the long and short vowel sounds, which seems to be instinctively appreciated in all languages, is fully recognised by them. Ah! Eh! Oh! Oo! hélas, alas; bah, pah, ha-ha, he-he, pshaw, ho-ho, so-so, poh, umph, ugh, hugh, etc.; these, and the like inarticulate sounds, in which the Indians largely indulge when excited, as in their dances, are, as it were, the raw material of language, with an instinctively recognised and unvarying significance. Some, at least, of the consonantal sounds have

their distinctive significances no less clearly traceable in the comparison of the representative utterances of wholly independent languages.

In the illustrations derived from the nomenclature adopted by the European colonists of the New World, we see the re-adaptation of the vocabularies of one continent to the natural objects peculiar to another and essentially different one. This process is seen reversed, when we turn to the native Indian languages. In them the animals introduced from Europe have almost invariably received a descriptive name. The horse is called, in the Cherokee, *sawquili*, the pack-carrier, from *u-sawqui-la*, he carries a pack. In the Delaware it is *nanayanges*, the animal that carries on its back; in the Chippewa, *paibaizhikogunzhi*, the animal with united hoofs; and in the Dakota it is rendered by a compound of *'sungka*, a dog, the only native beast of burden. Hence it becomes *'sungka-wakang*, the spirit-dog, or marvellous beast of burden. In such terms the contrast is obvious to the simple original forms, all probably traceable to an onomatopœic root, *e.g.*, Sanscrit, *açvah*, *ἵππος*, *equus*, *horse*. We thus perceive how, by such a process, a number of words may be called into existence by the presence of a single new object. The Indian languages abound in descriptive names, as is the case with many of those of Asia, and indeed none more so than the Sanscrit, which has a multitude of names for animals descriptive of their appearance, habits, cries, etc. But examples of self-originated words, derived from the observation of natural sounds, no less clearly prove that the New World has its own native root-words also. The following examples of Chippewa, Ottawa, and Mississaga onomatopœia will suffice to illustrate this part of the subject, as developed in the Algonquin dialects:—

Shi-sheeb, the duck.

Een-en-win, the duck. This cry is heard during spring from great flocks of ducks which then frequent the lakes.

Ah-ah-wan, a diver, a kind of duck.

Chee-chish-koo-wan, the plover.

Koo-koo-koo-oo, the owl.

Oo-oo-me-see, the screech-owl.

Mai-mai, the red-crested woodpecker, which repeats this sound about ten times in quick succession.

Pau-pau-say, the common spotted woodpecker; so called from the sound it makes in striking a tree with its bill.

Gah-kau-bân, a small owl, which repeats the cry *gah-kău* in the woods at night.

T'chin-dees, the blue jay.

Aund-a-gosh-kwân, the crow.

Gah-gau-ge-shîn, the raven.

Gah-yaush-ko-shân, the gull.

Bashk, a night-hawk.

Moosh-kah-oos, a kind of crane which frequents marshy places, and makes this sound, with a choking cry, in the evening.

No-no-no cau-see, the humming-bird.

Shi-shi-gwa, the rattlesnake.

Pe-zhew, the lynx, or wild-cat.

Koo-koosh, the sow.

Pah-kah-ah-kwân, the cock or hen.

Au-ko-ge-san, the frog.

Dend-dai, the bull-frog.

Pau-pau-ki-nay, the grasshopper.

In all those names the *n* has the French pronunciation, as in *matin*. The corresponding evidence of the origin of expressions for inanimate things by the same process of imitation, is still more interesting, as illustrative of the independent growth and expansion of languages. Thus *pwah*, to smoke tobacco, only occurs in compound words, as *pwah-gun*, a tobacco-pipe; *muh-na-pwah*, I am out of tobacco. The noise of waves, on the water, or dashing themselves against the rocks, is called *mah-dwa-yaush-kah*, *i.e.*, the lake roars. The imitative sound, *yaush*, is

sufficiently apparent. It is made to form a part of the name of the gull, the cry of which is generally accompanied by the sound of the waves; and is modified to express other noises, as *paush-ke*, it bursts with heat. As the wind travels through the forest, it produces different sounds, according to the character of the trees. In the pine forest it is a melancholy, prolonged gush, and is thus expressed: *mah-dwa-yaund-ah-gah-shi*. This is applied to the wind when sweeping through all trees the foliage of which is perpetually green, as the hemlock, cedar, and pine; but when it sways the forest branches of the maple, beech, and oak, it is *mah-dwa-bi-mah-gah-shi*. So also the Indian says, *gaus-kwa*, it makes a rustling noise; *tchuh-tchu-mo*, he sneezes; *gweesh-gwa-shi*, he whistles; he makes a noise with the hand on the mouth, is *sah-sah-qua*; it hails, *sah-sah-gun*; he coughs, *oo-soo-soo-dum*. To laugh is *bah-pĕh*, to cry, *muh-wĕh*; and many sounds pertaining to the arts and usages of the European intruders have given rise, in like manner, to the requisite additions to the Indian vocabulary; as *ut-to-tah-gun*, a bell; *paush-ske-zi-gun*, a gun.

These examples of self-originated elements of language may suffice to illustrate the peculiar force of that earliest notice of the divine gift of speech to man, when everything that had life received from him its name. In this first employment of human speech, one primeval source of the root-words of language seems to find its illustration in full accordance alike with *à priori* probabilities and with later experience. For in whatever form that intellectual endowment was bestowed, it is inconsistent with all philological analyses to conceive that the progenitors of our race received at the beginning a latent vocabulary of arbitrary but definite vocal utterances, fitted for intuitive adaptation to every subsequent revelation, alike of the external universe and the world of thought.

But a very different line of reasoning has been suggested to the mind of the most philosophical of the naturalists who have found an adopted home in the New World. "As for languages," says Agassiz, "their common structure, and even the analogy in the sounds of different languages, far from indicating a derivation one from another, seem to us rather the necessary result of that similarity in the organs of speech which causes them naturally to produce the same sound. Who would now deny that it is as natural for men to speak as it is for a dog to bark, for an ass to bray, for a lion to roar, for a wolf to howl, when we see that no nations are so barbarous, so deprived of all human character, as to be unable to express in language their desires, their fears, their hopes? And if a unity of language, any analogy in sound and structure between the languages of the white races, indicate a closer connexion between the different nations of that race, would not the difference which has been observed in the structure of the languages of the wild races—would not the power the American Indians have naturally to utter gutturals which the white can hardly imitate, afford additional evidence that these races did not originate from a common stock, but are only closely allied as men, endowed equally with the same intellectual powers, the same organs of speech, the same sympathies, only developed in slightly different ways in the different races, precisely as we observe the fact between closely allied species of the same genus among birds?"[1] Here the writer faces boldly the extremest conclusions to which such premises lead. *Race* is employed as the equivalent of *species*, and philological affinities in languages are viewed only as equivalent to the similarity of intonation in the notes of closely allied species of birds or beasts. They did not acquire such corresponding utterances by

[1] *Boston Christian Examiner*, art. *Types of Mankind*, p. 282.

learning each other's notes; and so the writer proceeds: "Why should it be different with men? Why should not the different races of men have originally spoken distinct languages as they do at present, differing in the same proportions as their organs of speech are variously modified? And why should not these modifications in their turn be indicative of primitive differences among them?"

That man has within himself not only the faculty of vocal utterance, which is the true equivalent of the voice of the lower animals: but also that power of evolution of an intelligent language by which to communicate his thoughts to other men, which is his grand distinction among animated beings, is unquestionable. It has been attempted to be shown, in previous pages, that language is not primarily the arbitrary association of articulate sounds with specific ideas, but that probably all primitive root-words had a recognised relation between sound and sense. This even extends to the separate phonetic elements of words; so that the choice of these appears to have a certain fitness, only now preserved to us in the mutilated fragments of primitive speech surviving in existing languages. From the ideas set forth above, it further follows that many root-words have been independently added at later stages, and in younger languages under process of development. The innate and primary significance of articulate sounds, however, maintains its influence throughout; and in innumerable cases corresponding sounds have been chosen to express independent, yet related ideas, in different languages. But it is a grave error to confound this unity of sound with the analogies of grammatical structure by which the affinities of languages have been traced; and it is no less a mistake to assume that the contrast between the harsh gutturals of the Red Indian, and the soft vocal modulations of the cultured European, presents any true analogy to the

organic differences which produce, on the one hand, the rough harsh cry of the eagle, and on the other the melodious trilling of the thrush. And here the mediæval antiquary comes to our aid. No Indian savage ever exceeded in ferocity the old Norse vikingr Regner Lodbrok, or Sidroc the Dane. By such, England and the Scottish Lowlands, from the Humber to the Forth, were chiefly settled under the Dane-lah conceded by Alfred to Guthrun; and by the same fierce sons of Odin was that land recolonized where, under the Normans of a later generation, the *Langue d'oil* acquired its greatest polish and regularity. The rough gutturals of the Norseman still give character to the Northumbrian and Scottish dialects, where they had no such mellowing element to subdue them as wooed the continental Norman to the harmonious language of the Trouvères. The change was doubtless in part an organic one, such as unfits the White for imitating the harsh gutturals of the Red Indian. We see this illustrated in the familiar alteration of voice which a slight inflammation of the bronchial glands produces; in the permanent change of the male voice at puberty; and also in its arrestment by emasculation. But if the supposed analogies between the notes of the wild bird of prey and the language of the wild Indian were true, the organic change should be accompanied not by the mere roughening of vocal modulations, but by the development of Indian speech. In England, where the Danish settlers long retained their native language, *Thorsby, Askerby, Coningsby,* and many another colonist's name, coupled with his Danish "*bye*," or abiding-place, still attest his former presence. In France, the corresponding *Tourville, Tancerville, Hagueville,* etc., show how speedily the rough Thor, Tancred, and Haco, accepted the Romano-French of their adopted country. What followed shows what change of language can effect

on the organs of speech;. and once more illustrates how indispensable it is to keep the intellectual elements ever before us as an essential part in the natural history, as well as in the civil history of man. "The phenomenon of the organs of speech yielding to social or moral influences, and losing the power of repeating certain sounds, was prominently observable amongst the Normans. No modern French Gazette writer could disfigure English names more whimsically than the Doomsday Commissioners of William the Conqueror. To the last, the Normans never could learn to say, '*Lincoln*;' they never could get nearer than '*Nincol*' or '*Nicole.*'"[1]

Nevertheless the phenomena presented to the naturalist by the American variety of man, as well as by the allied species of animals suggesting comparisons with others of the same genus in Europe and Asia, have taken strong hold on the mind of the gifted American student of science above referred to: in whose processes of induction, philological affinities and the grammatical structure of languages are of small account. As one curious collateral illustration of a phase in the organic elements of language, the arguments of Agassiz claim special notice here, as the ingenious speculations of the most distinguished among the scientific naturalists of America. In his latest contribution on this subject he observes: "Much importance is attached to the affinity of languages, by those who insist on the primitive unity of man, as exhibiting in their opinion, the necessity of a great affiliation between all men. But the very same thing might be shown of any natural family of animals: even of such families as contain a large number of distinct genera and species. Let any one follow upon a map exhibiting the geographical distribution of the bears, the cats, the hollow-horned ruminants, the gallinaceous birds,

[1] Palgrave, *History of Normandy and England*, vol. i. p. 703.

the ducks, or of any other families, and he may trace as satisfactorily as any philological evidence can prove it for the human language, and upon a much larger scale, that the brumming of the bears of Kamschatka is akin to that of the bears of Thibet, of the East Indies, of the Sunda Islands, of Nepal, of Syria, of Europe, of Siberia, of the United States, of the Rocky Mountains, and of the Andes; though all these bears are considered as distinct species, and have not any more inherited their voice one from the other, than the different races of man."[1] The same argument is applied throughout the different species referred to, down to the gay and harmonious notes of the thrushes, uttered by all "in a distinct and independent dialect, neither derived nor inherited one from the other, even though all sing *thrushish*."

So far as this ingenious analogy affects the question of innate or inherited voice, it amounts to no more than this, that bears are bears, and men, men. No philologist imagines the human voice to be inherited in any other sense than every part of man's organic structure is inherited. But neither does any philologist doubt that the language which his organs of speech enable him to express is inherited, that is, derived from others by imitation and memory, in a way that no inferior animal's utterances are acquired. The affinities thus noted by the observant naturalist relative to such closely allied systems of intonations running through each whole family are full of interest; though not from any analogies they present to the affinity of languages. They rather seem to illustrate the striking contrast between the gift of speech and the origin of languages. Each living being was created with its special organs of voice and utterance, and has perpetuated these with all the other specialities of its peculiar organization. The mew

[1] *Indigenous Races of the Earth*, p. xv.

of the cat embraces along with a labial consonant the whole range of vocalic sounds, *mi-a-e-o-u*, but so also does the familiar noise of the door swinging slowly on its hinges. The vocal sounds of the human voice can be executed with an organ stop, for they are produced mainly by the breath being expelled through the throat and mouth, lengthened or shortened by the lips according to the required note. So also the same organs of sound, when employed in whistling, can be made, like the artificial pipe, to imitate all the varied notes of singing-birds. But the finch transferred to the neighbourhood of the lark, or the cuckoo reared in the nest of the linnet, does not lose its own notes for those of its companions; as the English child reared in France or Italy, or stolen by the wild Indian of the American forests, acquires the speech of its nurse, and unless trained in its utterances, loses its own mother tongue.

The bray of the ass, though an act of volition, is no intellectual effort, such as the most foolish of human speech is. If the ass will utter its voice it cannot choose but bray; and no training, but only a complete change of its organs of sound, could enable it to low like the ox, or mew like the cat. There are indeed well-known exceptions, for we can teach the parrot, the starling, and one or two other birds, to imitate certain words, and even sentences: that is, to utter a few consecutive sounds of the human voice. In other words, we can so far superadd speech, in its narrowest sense, to the inarticulate utterances of their vocal organs; but we cannot give them language. Language pertains alone to him who is not only divinely endued with the breath of life, but the inspiration of the Almighty giveth him understanding. "According to my fullest conviction," says William Humboldt, "language must be regarded as naturally inherent in man, for it is altogether inexplicable as a work of his

understanding in its simple consciousness. We are none the better for allowing thousands and thousands of years for its invention. There could be no invention of language, unless its type already existed in the human understanding. Man is man only by means of speech, but in order to invent speech, he must be already man." It is only by conceiving an inevitable relation between the innate faculties or intellectual instincts of the human mind, and the constructional elements pervading all languages, that we can account for the remarkable structural consistency and comprehensive subjection to grammatical law, recognisable in the languages of rude unlettered tribes. The vocabularies of languages are complex, inconsistent, and frequently lawless, and as we trace them back, they are found to proceed from very diverse sources; but the further we follow up any language towards a conceivable beginning, the more full, complete, and consistent its grammatical forms prove to be. This alone seems sufficient to confute the idea of man's origin by development from any inferior, unintelligent order of animated beings. Such a conception, to which some modern theories of science so strongly tend, presupposes an animal devoid of speech; and as intellect dawns on it in its first stage of development into the reasoning and reflecting being, its originally limited powers of utterance gradually extend their compass, and language would thus be the slow product of effort, practice, and culture. On such a theory the detached elements of a vocabulary would be the first product; and the scientific relations of the grammatical forms of language would pertain only to its latest stages, and in their most perfected condition, to written languages. But the very opposite is the case; justifying the inference that an intelligent mind, and an understanding endowed with the forms and laws of structure involved in the

most perfect condition of language, were endowments of primeval man: fitting him for developing the associative relations of sound into a vocabulary expanding with his growing knowledge and intellectual requirements.

Such, then, appears to be a reasonable conception of the primeval occupation of man. Preeminent among created beings, with the full compass of vocal utterance, the type of language present in the human understanding, and the most delicate sense of association between his ideas of the external world, its forms and aspects, and articulate sounds: it was an intellectual instinct for him, replete with delight, thus to associate his ideas, by a fine sense of fitness, with articulate speech. Such, accordingly, is the work in which we find the first man engaged, as the sacred narrative discloses to us the earliest glimpse of him, entering on his terrestrial domain as the lord of the whole inferior creation; before the solitude of Eden presented to him a companion endowed with corresponding gifts, with whom he could exchange intellectual converse. Such, as it seems to me, is no unmeet occupation for him who there, surrounded by the exhaustless supplies of a luxurious climate, needing no superfluous ornament of dress, no busy loom, nor weapons for war or the chase; no palace wherein to dwell; no temple made with hands wherein to worship:

> "In naked majesty seemed lord of all,
> And worthy seemed."

Looking at the origin of language by the natural process here suggested, it is obvious that its unity may be too strongly insisted on as an inevitable consequence of unity of race; for the perception of the natural significance of articulate sounds, though blunted, is by no means lost. The exclamatory use of nearly all the vowel sounds has a universally recognised significance. The

instinctive and involuntary human utterances, of which laughing and crying are the most noticeable, though by no means the only ones, are in like manner universal; and all ears respond to the cultivated utterances of domesticated animals, and especially to the varying tones of man's universal companion, the dog. There it is, if at all, that we find any analogy to human language. Its whine, its bay, its whimper, its bark, its yelp, its growl, its snarl, its snap, its howl, are each distinct utterances; and every one of these names is a word directly derived from this dog-language. An intelligent dog can be spoken to, and catches many ideas from the sounds of its master's voice; while he, again, can tell by the tone of his dog's bark, when it is greeting an acquaintance, threatening an intruder, repelling a beggar; or whether it is only indulging in that liberty of speech which is the birthright of every civilized dog, and taking an abstract bark at things in general. By the process thus referred to, many considerable portions of national vocabularies must have originated independently; nor is the correspondence of words of this class in different languages any proof of a common derivation. They constitute what may be called a distinct species of words, and belong primarily to far older formations than the supplementary additions borrowed from foreign languages to supply the growing necessities which the progress of civilisation creates; though they may have their origin at any period of the growth of a language. Derived, however, from such natural sources, each locality and region will thus have certain distinctive features of its own. The very cries of animals, and the modulated rhythms of the wood-songsters, as well as the natural sounds peculiar to mountain, sea-coast, forest, and prairie, give origin to terms which become peculiar native root-words of certain localities. And, given a single new

root-word, we have seen to how great an extent the language may be enriched by its offshoots.

But while this theory of the primary origin of language is at variance with that idea of unity, which would seek to trace back the whole multiform vocabularies of the world to one common source; it by no means conflicts with the scientific recognition of the grammatical affinities of languages, whereby the closest relations may be traceable in their construction, with only a small percentage of words in common. Such is the relationship subsisting between the Anglo-Saxon and Sanscrit, though the latter was a dead language before the former acquired its insular life; or again, the contrasting correspondence traceable between certain of the languages of India, with a grammatical structure purely Tamul, and vocabularies chiefly Sanscritic. Names of things and the vocal equivalents of ideas are transitory, when compared with the grammatical construction of a language. The vocabulary is exposed to every arbitrary change and foreign intrusion. Whatever affects the use of the organs of speech, be it climate, acquired habits, or imitation of novel articulations, inevitably leads to some change in the words; so that instances are common, of mutually intelligible dialects of one language becoming in a few generations independent foreign tongues. The vocabulary has broken down, with trifling resistance to the transforming influence of external forces. Among the American Indian languages this is peculiarly noticeable; and is commented upon by the French Jesuit Fathers, as occurring within their own knowledge among Canadian tribes. But amid all this instability of the vocabulary, and the seemingly chance and lawless changes of a language adapting itself to the commonest wants of the uncultured savage: yet the grammatical structure survives, as in that of the Lenni-Lenapé or Delaware Indians, with its rich, regular,

and systematic forms closely following the analogy of the ideas they are intended to express; and adapting themselves to the most delicate modulations of thought. Here is an element of language, to which the sweetest harmonies of modulated wood-note rhythms present no analogy. By inflections as truly regulated by the science of grammatical laws as the language in which Plato wrote and Pindar sung, the wild, unlettered Indian modifies each root-word, or complex word-sentence, so as to express number, time, quality, or passion, as if guided by an intellectual instinct operating upon the reasoning faculty common to man.

CHAPTER IV.

THE PRIMEVAL TRANSITION: INSTINCT.

A PRIMEVAL "stone period," preceding the earliest discovery of metallurgic arts, appears to underlie the most ancient traces of European civilisation, and according to recent discoveries carries back the evidence of man's presence in Europe to ages long prior to the earliest glimmering of a historic dawn. Some "invisible things from the creation of the world, are thereby clearly seen, being understood by the things that are made." And how grand are the promises of coming revelations in reference to man, which such glimpses disclose. "To every thing there is a season, and a time to every purpose under heaven." Through the unmeasured vistas of the past they move onward with measured and beautiful progression. Man existed in the purposes of God through countless ages, before the world, with all its teeming life, was animated with new life by his presence; and knowledge also for man has tarried its appointed time. Letters, arts, numbers, maritime discovery, the invention of the great mechanical powers, the evolution of the great intellectual disclosures, astronomy, gravitation, geology, and ethnology itself, have each had their time to be born, and were each an impossibility till then. And what are these but glimpses of what is yet to be revealed; stimulants to exertion, encouragements to hope: and also fresh proofs of man's immortality, since time is so inade-

quate for the study of the universe of God. "I know that whatever God doeth, it shall be for ever. Nothing can be put to it, nor anything taken from it; and God doeth it, that men should fear before him."[1] Like children, we receive each new gift of knowledge, each fresh acquisition of power, withheld from us till we were able to turn them to some wise account. And why then should we despair of any conceivable compass of the revelations that shall be?

Human intelligence and research have already accomplished so much, that ignorance alone can presume to resign any past event to utter oblivion. Between "the *Beginning*," spoken of in the first verse of the book called Genesis, and the creation of man, the most humble and devout of Biblical students now acknowledge the intervention of ages, compared with which man is indeed but of yesterday. Our whole written materials concerning all those ages are comprehended in the few introductory words of the Mosaic narrative, and for thousands of years man knew no more. Yet all the while, the geological record lay there open before him, awaiting God's appointed time. What so inconceivable as the recovery of the world's history prior to man's creation; but, indeed is not everything impossible until it is done? and the history of man himself, though so much less inconceivable, also an impossibility until it has been accomplished?

But ethnological science bears a much closer relation to the researches of the geologist than to the investigations of the antiquary. Hence the value and significance of its system of classification. In studying the natural history of man, a great point is gained if we can establish the fact that in certain stages of his social development he existed without any knowledge of metallurgic arts, and to these stages we give the name of the "Stone

[1] Ecclesiastes iii. 14.

Period." Also, it is of value to note the characteristics developed by the introduction of metallurgy; and as a very important stage is chiefly marked by the use of copper and its simplest alloy, this is designated the "Bronze Period." Finally, the most abundant and practically useful of all, iron, is discovered and brought into use; and the period of transition between that of ethnological archæology and authentic written history is termed the "Iron Period." But these are ethnological, not geological periods, and differ widely in their application from the latter; and it is desirable that this should be fully perceived, in order to avoid needless conflict with the labours of the antiquary, or any appearance of slighting his valuable but diverse researches. Each study has its own legitimate functions, though also they have necessarily somewhat in common. The Roman antiquary, as we have seen, admits that there is *something poetical* "in talking of an age of stone, or an age of bronze, or an age of iron, but such divisions have no meaning in history, which cannot be treated as a physical science." But neither ethnology nor archæology advance any pretence to being history; nor, indeed, can Roman antiquities claim to be so, though they have a more direct relation with it in such limited sense.

When we turn to the learned volumes of the classical antiquary, the main subjects of investigation are inscriptions: religious, military, sepulchral, and miscellaneous. The very brick has its written record stamped on it. Then comes the ruined villa, with its personal ornaments, domestic utensils, mural paintings, and fictile ware, all of them occasionally inscribed. Next follow the rich stores of the numismatist, supplying a consecutive chronicle of illustrated historical incidents. These are just as much written chronicles as any mediæval manuscript. For the most part they are more minute, accurate, and

free from the obscurities begot by credulity or prejudice. Moreover, these, along with the minuter relics which the Roman antiquary catalogues and describes, are merely illustrative appendices and commentaries on histories already familiar to him. But the ethnologist, and the primitive archæologist as such, aim at different results, and by an essentially different kind of evidence. The object alike of ethnology and archæology is to investigate the physical history of man, in part as the highest branch of natural history, but also as no unimportant introduction to the details of civil and personal history. The language of all critical inquiry, prior to the very recent period when the example and deductions of the geologist had expanded the views of the archæologist, and enlarged his means of investigation relative to primitive history, may be aptly summed up in the words of a distinguished literary antiquary already referred to. "We have no choice," says Sir Francis Palgrave, in his *History of Normandy and England*, "save between the light and the darkness; for with respect to the pristine ages of the world we know nothing historically true beyond the facts whereunto Holy Scriptures bear their witness. The same ineffable wisdom, speaking in them, has also annihilated every other authentic record of those remote eras; or covered the memorials, if any exist, with an obscurity which no acuteness can dispel." But is it indeed so? This so-called "*light*" is, with the student of mediæval history, the era of chroniclers who often lie, still oftener blunder, and not unfrequently add to all an obscurity which acuteness is very apt to darken in the attempt to dispel.

The whole religion and philosophy of man are comprehended in the two great questions, WHENCE? and WHITHER? To the one of these Religion alone responds with her divinely-authenticated revelations; to the other

History attempts to reply, with her imperfect and fragmentary additions to the sacred record of pristine ages; but for the world's primeval history Nature also has her recorded revelations, though for well-nigh six thousand years they lay unheeded or misread. Yet the records of that geological history, pertaining to epochs long prior to the chronologist's date of the beginning of time, are not less, but more trustworthy than the great mass of historical chronicles.

It is not the attribute of a large and liberal-minded student to disparage other branches of study, because they differ from his own. Geology and archæology are but successive links in the same great chain of reasoning. The earliest data of the archæologist are found, where those of the geologist draw to a close, in the debatable land of the later alluvial formations; and in so far as history is the social biography of nations, these chapters of our race's childhood and early youth, which thus follow in uninterrupted sequence after the closing pages of the geologist, are no less interesting and important to us, as a race, than the youthful records of the individual poet, philosopher, or hero, which often supply the key to all that renders biography most worthy of study. The further, indeed, our researches are pursued into the present, the more are we impelled to aim at an ampler knowledge of the past; for ethnology and history alike affirm, with an authority that will not be gainsaid, that some races of the human family prove themselves born to dominion; while others seem to have been ever destined to the yoke of servitude, or but to hold possession of their appointed lease of earth, until some chosen De Gama or Columbus has revealed their secret, and the supplanter summons them to give place.

Into some, at least, of the questions which ethnology and archæology are originating, it must be the province

of the historian to inquire. The national individuality of Egypt, India, or Greece cannot be separated from the grand results which their histories disclose; for on these the ethnological peculiarities of each stamped some of their most marked distinctions. The diverse elements commingled in our British race, and their illustrative arts, languages, and memorials of many kinds, are receiving an ample, if not always a wise or discriminating study. Nor, while the ethnic specialities of the ancient world engage attention, can it be overlooked that America still presents for us a singularly interesting phase of primitive social life: the life of the forest savage, inherited from an ancient past; while beyond it lie, half obliterated, monuments of an extinct civilisation, with memorials of rites and mythology, which still tempt many bold comparisons with the oldest chronicles of social life in the African birth-land of arts and polity. It is not altogether for the direct truths which he may glean, that the historian finds encouragement in pursuing his investigations beyond the limits of written and graven annals, to the earliest efforts of intellect and the primitive traces of human arts. These prehistoric annals are guides to secondary yet all important truths, showing how deeply the sources of human action lie implanted in the nature of man; and how essential to the just interpretation of the external life of a nation is the knowledge of the ethnic elements, and the intellectual germs, pure or mingled, out of which it has been evolved. For such ethnic elements are not peculiar to ancient nations, nor have they wrought only in primitive times. They survive as vigorously and as vividly now as when they puzzled the observant credulity of Herodotus, or dignified to Tacitus the chroniclings of Rome's despised barbarian conquests.

Reasons have been advanced in the previous chapter,

appearing to justify the belief that the earliest and true primeval condition of man was a stone-period: that is to say, one devoid of metallurgy; and that his mechanical arts were of the simplest kind. But that he was, therefore, of necessity, a savage, is, as we have seen, very far from being a legitimate conclusion. The degradation of his moral nature, and not the absence of the arts which we associate with modern luxury and enterprise, made him a savage. The Arab sheikh, wandering with his flocks over the wild pastures of the desert, is not greatly in advance of the Indian of the American forests, either in mechanical skill or artistic refinement; yet the Idumean Job was just such a pastoral Arab, but, nevertheless, a philosopher and a poet, far above any who dwelt amid the wondrous developments of mechanical and artistic progress, in the ancient cities of the Tigris or the Euphrates. It is not to be inferred, however, as appears by some writers to be done, that the whole history of the human race, and each of its separate divisions, is affirmed to disclose a regular succession of periods—Stone, Bronze, and Iron, or however otherwise designated,—akin to the organic disclosures of geology; or that where their traces are found, they necessarily or invariably imply such an order in their succession. The only true analogy between the geologist and the archæologist lies in this, that both find their evidence imbedded in the earth's superficial crust, and deduce the chronicles of an otherwise obliterated past by legitimate induction therefrom. The essential and radical difference between the palæontologist and the ethnologist lies in this, that the one aims at recovering the history of an unintelligent and purely instinctive division of extinct organic life; the other investigates all that pertains to a still existent, intelligent being, capable of advancing from his own

past condition, or returning to it, under the most diverse external circumstances. Excepting, therefore, the nature of their evidence, and their mode of using it, all is contrast rather than comparison.

Amid that wondrously diversified series of organic beings which pertains to the studies of the geologist, there appears at length one, "the beauty of the world, the paragon of animals,"[1] made in the image of God; a being capable of high moral and intellectual elevation, of wondrous design, and with a capacity for transmitting experience, and working out comprehensive plans by the combined labours of many successive generations. In all this there is no analogy to any of the inferior orders of being. The ant and the beaver, the coral zoophyte and the bee, display singular ingenuity and powers of combination; and each feathered songster builds its nest with wondrous forethought, in nature's appointed season. But the instincts of the inferior orders of creation are in vain compared with the devices of man, even in his savage state. Their most ingenious works cost them no intellectual effort to acquire the craft, and experience adds no improvements in all the continuous labours of the wonderful mechanicians. The beaver constructs a dam more perfectly than all the best achievements of human ingenuity in the formation of breakwaters, and builds for itself a hut which the author of the *Decline and Fall of the Roman Empire* justly contrasts in architectural skill with the ruder dwelling of the Asiatic Tartar. The bee, in forming its cell, solves a mathematical problem which has tasked the labours of acutest analysts. But each ingenious artificer is practising a craft which no master taught, and to which it has nothing to add. The wondrous, instinctive, living machine creates for itself the highest

[1] *Hamlet*, Act ii. sc. 2.

pleasure it is capable of, in working out the art with which it is divinely endowed; and accomplishes it with infallible accuracy, as all its untaught predecessors did, and as, without teaching, each new-born successor will do. To such wondrous architects and artists history does not pertain, for their arts knew no primeval condition of imperfection, and witness no progress. Of their works, as of their organic structure, one example is a sufficient type of the whole. The palæontologist's relics of preadamite life have been designated by one popular geologist, "The Medals of Creation;" and the term, though borrowed from the antiquary, has a significance which peculiarly marks the contrast now referred to between the objects of study of the geologist and the archæologist. Like the several medals struck in the same die, the multitude of examples of an extinct species, each exquisitely sculptured coral, and every cast of a symmetrical sigillaria, repeat the same typical characteristics. One perfect example is an unfailing type of all, and the cabinets of a thousand collectors may present the like illustrations of extinct organic life. The palæontologist's one perfect example of an extinct species, is for every purpose of science a specimen of all examples of such; even as the naturalist's history of one specific zoophyte, ant, or beaver, is the history of all; and the poet's fancy may be accepted as literally true, that—

> "All the winged habitants of paradise,
> Whose songs once mingled with the songs of angels,
> Wove their first nests as curiously and well
> As the wood minstrel in our evil day
> After the labour of six thousand years."[1]

But with the relics of human art, even in its most primitive and rudimentary forms, it is far otherwise. Each

[1] Montgomery, *Pelican Island.*

example possesses an individuality of its own, for it is the product of an intelligent will, capable of development, and profiting by experience.

But what experience was, we know not, nor to what results it led, in the generations of that antediluvian world, the brief biographies of whose patriarchs sum up the records of well-nigh a thousand years in such words as these: "And all the days of Methuselah were nine hundred sixty and nine years; and he died." Whatever its intellectual and artistic results were, the close of that first human era indicated a moral degradation, which experience only tended further to corrupt; and when we look on the descendants of the postdiluvian fathers of a renovated earth, man is still the same in intellectual and moral capacity, but the days of his years had been made as an handbreadth. And yet even with his brief threescore years and ten, how wonderful is the accumulated knowledge and experience of a lifetime; and with how mournful a sense of irreparable loss do we often look upon the gathered knowledge of years dissipated in a moment by the hand of death: the casket broken, and the jewels scattered and for ever lost. I had a brother once, a man of noble, genial nature, and high intellectual capacity, just ripening to maturity. What he did is not insignificant, in a career so brief and checkered. But what could he not have done had God spared him? But what is the accumulated experience of an Edward Forbes or a George Wilson, just attaining their prime, or a Hamilton or Humboldt, hoary with the weight of years and honours, when we attempt to realize the progress of those primeval centuries, the history of which comes to us in biographies of its great and good men, such as this: "And Adam lived an hundred and thirty years, and Eve bare him a son in his own likeness after his image, and they

called his name Seth. And to Seth, to him also, after he had lived an hundred and five years, there was born a son, and he called his name Enos. Then began men to call themselves by the name of the Lord. And Seth lived after he begat Enos eight hundred and seven years, and begat sons and daughters. And all the days of Seth were nine hundred and twelve years: and he died."

It is the world before the flood: a mystery to us; yet not altogether perhaps without its existing records. The apparent antiquity of the disclosures of human art in the drift point to some unperished memorials of a time coeval with the generations of antediluvian patriarchs; and when science has recovered so much in reference to protozoic life, who shall pretend to limit the possible disclosures relative to eras thus comparatively modern! Works wrought, like the ark, in gopher wood, and the fragile beauties, perchance, of a luxuriously developed art, such as the sensuous refinement of later generations has begotten amid the grossest sensualities, have perchance all perished; but hidden chronicles have recently been revealed to us, so amply displacing a seemingly triumphant oblivion of old centuries, that the oldest cannot be undoubtingly asserted to be utterly beyond recall.

But let us now glance at some of those various and very diverse disclosures relative to man's primitive condition of undeveloped ingenuity in mechanical science and metallurgic knowledge. And first, in seeming chronological order are those discoveries pertaining to the transitional common ground of geology and archæology: the human arts in the drift, or in ossiferous caves, among the bones of strange orders of beings hitherto supposed to have been extinct long anterior to the existence of man. In the ancient alluvial deposits—most

modern among the strata of the geologist,—lie abundant traces of extinct animal life, belonging to that recent transitional era of the globe in which man was introduced to his terrestrial inheritance. Nevertheless, these present in nearly all respects a contrast to everything we are familiar with in the history of our earth as the theatre of human action, scarcely less striking than that old geological epoch when the liassic ocean of southern England swarmed with strange ammonites, belemnites, and other cephalopoda; and the reptilian saurians sported in its waters, or monstrous pterodactyles glided over the surface on their huge bat-like wings.

To the archæologist those diluvial strata are his prehistoric chronicles, rich in precious records of that primeval transition in which the beginnings of his own history lie. In a zoological point of view these post-tertiary formations include man and the existing races of animals, as well as the extinct races which appear to have been contemporaneous with indigenous species. How early in that closing geological epoch man appeared, or how late into that archæological era the extinct fossil mammals survived, are the two independent propositions which the sister sciences have to establish and reconcile.

The insular character of Great Britain renders it a peculiarly interesting epitome of archæological study, a microcosm complete in itself, and little less ample in the variety of its records than the great continent, divorced from it by the ocean; yet the question may be reopened, Was it already insular when its earliest allophylian nomade first trod its unhistoric soil? The Caledonian allophylian, as we now know, pursued the gigantic Balæna in an estuary which swept along the base of the far-inland Ochils, and guided his tiny canoe, above an ocean bed, which had to be upheaved into the sunshine of long

centuries before it could become the grand arena of deeds that live associated on the historic page with the names of Agricola, Edward, Wallace and Bruce, of Montrose, Cromwell, and Mar. Its history dawns in an era of geological mutation; yet not more so than such as is now at work, in the grand solemn march of unwearying Time in other and neighbouring historic lands. It is a type of the changes which were working elsewhere, and gradually transforming that strange post-tertiary microcosm into the familiar historic Britain of this nineteenth century.

From an examination of its detritus and included fossils, and from the disclosures of the peat-mosses, we learn that, at the period when the British Isles were taken possession of by their first colonists, the country must have been almost entirely covered with forests, and overrun by numerous and strange races of animals long extinct. In the deposits of marl that underlie the accumulated peat-bogs of Scotland and Ireland, are found abundant remains of the fossil elk, an animal far exceeding in magnitude any existing species of elk or deer. Its bones have been found—at Walton, in Essex, for example,—associated with skeletons of the mastodon, and in the diluvium at Folkstone, with numerous teeth, jaws, and detached bones of the extinct rhinoceros, hippopotamus, hyena, fossil ox, etc.; yet little doubt is now entertained that the elk was contemporaneous with primeval man in the British Isles. Groups of skeletons have been discovered crowded together in a small area, as at Curragh, in Ireland, with the antlers lying thrown back on the shoulders, as if a herd of elks had sought refuge in the marshes, and perished floundering in the morass. Some of their bones are still in so fresh a condition, that the marrow in them has been described as having the appearance of fresh suet, and burning with a clear flame.

Stone hatchets, flint arrow-heads, and fragments of pottery have been found with these skeletons, under circumstances that have abundantly satisfied geologists, as well as archæologists, of their contemporaneous deposition; and still further evidence seems to exhibit this gigantic elk as an object of the chase, and a source of primitive food and clothing. Professor Owen, in his *British Fossil Mammals*, has disputed Dr. Hart's supposed example of an elk rib marked with the wound of an arrow; but Professor Jamieson and Dr. Mantell note the more interesting discovery, in the county of Cork, of a human body exhumed from a marshy soil, beneath a peat-bog eleven feet thick. The soft parts were converted into adipocire, and the body, which was thus still in good preservation, was enveloped in a deer-skin of such large dimensions, as to lead to the opinion that it belonged to the extinct elk. Whether or not the latter conclusion can be regarded as more than a probability, there appear to be little just grounds for doubt that this now extinct species was coeval with the aborigines of the British Islands. In the same recent formation have been found abundant traces of animals having a special interest in relation to our present subject, as not only adapted for the chase, but suitable for domestication. Of the ancient British *Bovidæ*, the remains of the great fossil ox (*Bos primigenius*) are of frequent occurrence, especially in the alluvial deposits of Scotland. One skull, in the British Museum, from Perthshire, measures a yard in length, and the span of the horns is forty-two inches. Sir Henry de la Beche refers, in the *Geological Observer*, to the discovery, in various submarine forests, of foot-prints mingling with those of the deer, and which he conceives may have been those of the great fossil ox. Of its existence contemporaneously with the British aborigines no doubt can be entertained, for its bones have

been found in British tumuli, and even mingling with Roman remains.

The evidence supplied by the ossiferous caves of England, as of the continents of Europe and America, is full of interest from corresponding revelations. Kirkdale Cave, near Kirkby Moorside, Yorkshire, has acquired a special celebrity from the description and illustration of its contents, given by Dr. Buckland in his *Reliquiæ Diluvianæ*, in connexion with a diluvial theory subsequently abandoned. But Kent's Hole, near Torbay, has been already referred to, not only as one of the richest depositories of British fossil carnivora, but also as having yielded no less remarkable traces of primitive human arts. When first examined, its roof was clustered with the pendant cones of stalactite, and the floor thickly paved with concretions of stalagmite, beneath which lay, hermetically sealed, the prized relics of the geologist and archæologist, safe alike from disturbance and decay. These have been minutely described in the *Cavern Researches* of the Rev. J. MacEnery, by whom it was first explored. From the accumulated relics of this ossiferous cavern, so rich in evidence of that common transitional ground on which the geologist and the archæologist meet, have been recovered many of the later palæontological specimens which now enrich the British Museum; and to its disclosures both Buckland and Owen have acknowledged obligations for some of their most important data. But the archæological evidence is not less important. Intermingled with fossil remains of species of the rhinoceros, cave-hyena, great cave-tiger, cave-bear, and other extinct mammalia in unusual abundance, lay numerous relics of human art, not only indicating the ancient presence of man, but proving that he also, as well as some of these extinct carnivora, had found there a home. His tools of bone, like others found on many primitive

British sites, exhibit the most infantile stage of rudimentary art. Fragments of sun-baked urns, and rounded slabs of slate of a plate-like form, were associated with the traces of rude culinary practices, illustrative of the habits and tastes of the primeval savage. Broken pottery, calcined bones, charcoal, and ashes, showed where the hearth of the allophylian Briton had stood; and along with these lay dispersed the flints, in all conditions, from the rounded mass as it came out of the chalk, through the various stages of progress, on to the finished arrow

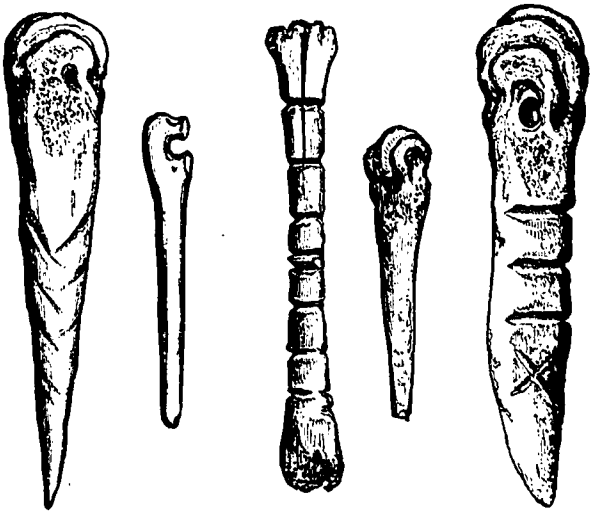


FIG. 1.—British Bone Implements.

heads and hatchets; while small flint-chips, and partially used flint-blocks, thickly scattered through the soil, served to indicate that the ancient British troglodyte had there his workshop, as well as his kitchen, and wrought the raw material of that primeval stone-period into the requisite tools and weapons of the chase. Nor were indications wanting of the specific food of man in the remote era thus recalled for us. Besides accumulated bones, some at least the spoils of the chase, near the mouth of the cave a number of shells of the mussel, limpet, and

97373

oyster, with a palate of the scarus, lay heaped together, indicating that the British aborigines found their precarious subsistence from the alternate products of the chase and the spoils of the neighbouring sea.

Such traces of aboriginal life in the British cave-dwellers of Torbay, closely correspond with those observed in exploring some of the remarkable artificial caverns, or Scottish Weems. They are minutely described in the *Prehistoric Annals*, and need not be further referred to here, except for one more index they serve to furnish of primitive tastes. A remarkable example of these subterranean stone-dwellings at Savrock, near Kirkwall, in Orkney, was situated, like the natural Torbay cavern, close to the sea-shore. The accumulated remains of the charcoal and peat ashes of the long-extinguished hearth lay intermingled with bones of the small northern sheep, the horse, ox, deer, and whale, and also with some rude implements illustrative of primitive Orcadian arts; while a layer of shells of the oyster, escallop, and periwinkle, the common whelk, the purpura, and the limpet, covered the floor and the adjacent ground, in some places half a foot deep. Of these, the limpet, though common on the coast, formed only a very small proportion of the whole, while the periwinkle was the most abundant. The relative accumulations of the other shells—differing as they did from the present ratio of the various mollusca on the neighbouring shores,—in like manner furnished some slight index of the culinary taste of the aboriginal Briton in those long-forgotten centuries.

It is curious and instructive thus to note even so small a matter as the tastes of the rude barbarian Briton, for they supply a means of comparison between the very diverse races of the British Islands in remotely ancient and modern times. The periwinkle is now annually

shipped in large quantities from the Scottish coasts to supply the markets of the British metropolis; and at the meeting of the British Association at Dublin in 1857, a paper was read before the zoological section, tending to show that such is the demand for that favourite mollusc, that it is in danger of being extirpated on the Irish coasts.

By such facts the remote past is brought once more into intimate relation with the present; and even in matters so apparently trivial as the nice discrimination of the palate between the *Patella vulgata* and the *Turbo littoralis*, we detect a correspondence between the tastes of the rude aboriginal savage and the civilized Anglo-Saxon of the British metropolis; though even now it is as a popular favourite, and not as a coveted delicacy, that the periwinkle, and also the larger *Buccinum undatum* or waved whelk, are imported into London, and gathered on the Scottish and Irish coasts.

At Skara, near the house of Skaill, in the west mainland of Orkney, one of a singular class of early, though probably only comparatively ancient stone structures, designated *Pict's houses*, is remarkable for an immense accumulation of ashes round it, several feet in thickness, plentifully mixed with shells, and the horns and bones of deer and other animals. The building itself has been only very partially explored, but many curious relics have been recovered from the surrounding débris. Among these are circular disks of slate, similar to those found in Kent's Hole Cave, a large tusk of a wild boar, horns of the red-deer, and numerous implements made of horn and bone. But not the least curious of those primitive relics was a box, constructed of stones laid together in the form of a miniature cist, within which were about two dozen oyster-shells, each pierced in the centre with a hole large enough to admit the finger. Oysters, it may

be remarked, are rare in Orkney. They now occur only at two places, Deersound and Frith, the nearest of which is eight miles distant from Skaill; while the osteological remains which accompanied them are those of long extinct Orkney mammals. There is no tradition either of the deer or the boar in the Orkney Islands, unless the names of the Deerness headland and the neighbouring sound be assumed as topographical memorials of the presence of the former within Norse or Saxon times. It is scarcely possible, indeed, to conceive of the existence of such *ferœ naturœ* for any length of time, within so small an area, after the occupation of these islands by a human population.

Such are mere indications of a class of evidence alike abundant, and now readily accessible, relative to the ancient traces of man and his arts, in the British drift. To those have now to be added, without materially affecting the bearings of the evidence as a whole, discoveries made by Mr. Frere in Suffolk, so long ago as in 1797, of flint weapons in conjunction with elephant remains, imbedded in gravel overlaid by sand and brick-earth, at a depth of eleven to twelve feet from the surface. Some of these weapons are preserved in the British Museum, and in the collection of the Society of Antiquaries, and are described in a recent communication to that Society by Mr. Evans, as identical in form with those on the Continent. "They present no analogy in form," he observes, "to the well-known implements of the so-called Celtic or stone-period, which, moreover, have for the most part some portion, if not the whole, of their surface ground or polished, and are frequently made from other stones than flint. They have indeed every appearance of having been fabricated by another race of men," and it may be added are on a much larger scale, as well as of ruder workmanship. Since renewed attention has

been directed to the curious but little heeded discovery in the post-pliocene beds of Suffolk, by the disclosures at Abbeville and Amiens, the researches of Mr. Joseph Prestwich and others have been rewarded by the recovery of additional primeval flint implements on other English sites, in the same diluvial gravel and clay in which teeth and bones of the *Elephas primigenius*, the *Rhinoceros tichorhinus*, the *Hippopotamus major*, and other extinct fossil mammals abound. They have been recently found at Icklingham, a second Suffolk locality, near to Cambridgeshire; in Kent, on the coast between Herne Bay and the Reculvers, and at Swalecliff, near Whitstable; at Biddenham in Bedfordshire; and in other post-pliocene deposits of the south of England. All of the specimens present the same remarkable contrast to the small and more finished implements pertaining to the earliest sepulchral deposits. Compared with these, they seem to be the memorials of an age of ruder strength and still more infantile skill.[1] This at least they place beyond all question, that the occupation of Britain and the north of Europe by its earliest human population must be referred to a period, compared with which the era indicated by Roman, or the earliest ascertained Celtic arts, is but of yesterday. Let us now leave behind us that old continent with its confusing elements pertaining to times when the ambition of Rome's "laurel-locked, high-ghosted Cæsars" so overrode all nationalities, and obliterated the memories of history, that even now it is hard to persuade men there was a European world before that of the Cæsars.

The city of Toronto, on the northern shore of the great Lake Ontario, is built on the drift clays which have accumulated above the rocks of the Lower Silurian formation to an average depth of upwards of thirty feet, and in

[1] *Quarterly Journal of Geol. Soc.*, vol. xvii. p. 362.

some places are more than seventy feet deep. The construction of an esplanade along the lake shore of the city, during recent years, has exposed a cutting of upwards of two miles in length, and averaging seventeen feet in depth. The operations thus carried on have laid bare the virgin soil of the most populous site now devoted to the civilizing processes of European colonization in Upper Canada. In one case only, so far as I have been able to ascertain, did any trace of prior human presence appear. At the depth of nearly two feet from the surface, in front of the Parliament buildings, the bones and horn of a deer lay amid an accumulation of charcoal and wood ashes, and with them a rude stone chisel or hatchet. There were no precise indications that these relics were of great antiquity, or indeed, that they were other than modern; possibly they may be as old as the time of Jacques Cartier's discovery of Canada; not impossibly they may date beyond the era of Columbus, and the intrusion of European aggressors on Indian hunting-grounds. But the travelled fossils of the Toronto drift are of a very different era, and belong to the Hudson river group of the Lower Silurian, like the rocks on which it is superimposed. These casts of Lower Silurian fossils, however, are no index of the date of the greatly more modern drift in which they are now enclosed; and which, with very varying organic remains embedded in its clay and gravel, overlies the true fossiliferous rocks of Western Canada; and seems to make of its long stretch of wooded levels and gentle undulations, a country fitted to slumber through untold centuries under the shadow of its pine-forests, until the new-born mechanical science of Europe, with its novel applications of the metallurgic arts, provided for it the railway and the locomotive, and made its vast chain of rivers and lakes a highway for the steamboat. With such novel facilities

added to the indomitable energy of the intruding occupants, the whole face of the continent is in rapid process of transformation; and it is well, ere the change is completed, that some note be made of every decipherable index of the characteristics of a past thus destined to utter obliteration.

From the uncleared wilds that still occupy the shores of Lake Superior, south-eastward through the great lakes and rivers to the valley of the St. Lawrence, those drift deposits reveal to the geologist marvellous changes that have transpired in that extensive area of the North American continent, through a greatly prolonged period of what to him are recent times. Along the low shores stretching away from the rapids of Sault Ste. Marie to the virgin forest of Lake Superior, the huge granitic boulders lie strewed like the wreck of some Titanic Babel; and wherever the waves of the St. Lawrence reopen the deposits along the lower portion of the valley in which they now lie, the sea-bottoms of an ancient ocean are revealed, frequently with littoral or deep-sea shells imbedded at different levels in the stratified drift. But remote as is the antiquity, according to all human chronology, to which the fauna of these beds of marine detritus belong, the palæontologist detects among their post-tertiary fossils the phoca, balænæ of more than one species, fishes, articulata, and the shells of many mollusca still inhabiting the neighbouring ocean along the northern Atlantic coasts. The period, therefore, which embraces those relics of ancient life is the same to which man belongs, and they mark for it one of the phases of that last transitional era during which the earth was being prepared for his entrance upon it. Since the natica, fusus, turritella, and other marine animals of the post-pliocene period, were the living occupants of the St. Lawrence valley, vast changes have been wrought

on the physical geography of the continent. The relative levels of the sea and land have altered, so as to elevate old sea-margins to the slopes of lofty hills, and leave many hundred miles inland the escarpments wrought by the waves of that ancient sea. The conditions of climate have undergone no less important changes, developing in a corresponding degree the new character and conditions of life pertaining to this bed of an extinct ocean: covered with successive deposits of marine detritus, and then elevated into the regions of sun and rain, to be clothed with the umbrageous forest, and to become the dwelling-place through another dimly-measured period, of the wapiti, the beaver, and the bison; and with them, of the Iroquois, the Huron, and the Chippewa: all alike the fauna of conditions of life belonging to a transitional period of the New World preparatory to our own.

Marvellous as are those cosmical revolutions belonging to the period of emergence of the northern zone of America from the great Arctic Ocean: when we look on each completed whole the process appears to have been characterized by no abnormal violence. Slowly through long centuries the ocean shallowed. The deep sea organisms of a former generation were overlaid by the littoral shells of a newer marine life, and then the tidal waves retreated from the emerging sea-beach; until now we seek far down in the gulf of the St. Lawrence and on the coast of Labrador for the living descendants of species gathered from the post-pliocene drift. Thus we see in the living natica, fusus, or turritella of the Atlantic coasts, the lineal representative of an ancestry reaching back to such antiquity as renders ephemeral the boasted pedigrees of Europe's oldest Norman or Roman blood; while by the corresponding fossils of the post-tertiary drift—which to the common eye seem in-

significant enough,—the closing epoch of geology in the New World is brought into contact with that in which its archæology begins; and we look upon the North American continent as at length prepared for the presence of man.

Such records are here noted among the disclosures of the great valley of the St. Lawrence, which drains well-nigh half a continent; for it is in the valleys by which the present drainage of historic areas takes place, that not only such deposits of recent shells and fossil relics of existing fauna are found: but also that the most extensive remains of extinct mammalian fauna are disclosed, in association with objects serving to link them with those of modern eras. In formations of this character have been found, in the lower valley of the Mississippi, the *Elephas primigenius*, the *Mastodon Ohioticus*, the *Megalonyx*, *Megalodon*, *Ereptodon*, and the *Equus curvidens*, or extinct American horse; with many other traces of an unfamiliar fauna, and also a flora, contemporaneous with those gigantic mammifers, but which also include both marine and terrestrial representatives of existing species. Corresponding in its great geographical outlines very nearly to its present condition, the American continent must have presented in nearly all its other characteristics a striking contrast to its modern aspect: clothed though it seems to us in primeval forests, and scarcely modified by the presence of man. In the post-pliocene formations of South Carolina, exposed along the bed of the Ashley River, remains of the megatherium, megalodon, and other gigantic extinct mammals occur, not only associated with existing species peculiar to the American continent, but also apparently with others, hitherto believed to have been domesticated and introduced for the first time by modern European colonists. But still more interesting for our present purpose, as

possibly indicating the contemporaneous existence of some of those strange extinct mammals with man, are notices of remains of human art in the same formation. Professor Holmes, in exhibiting a collection of fossils from the post-pliocene of South Carolina, before the Academy of Natural Sciences of Philadelphia, remarked: "Dr. Klipstein, who resides near Charleston, in digging a ditch for the purpose of reclaiming a large swamp, discovered and sent to me the tooth of a mastodon, with the request that I should go down and visit the place, as there were indications of the bones and teeth of the animal still remaining in the sands which underlie the peat-bed. Accordingly, with a small party of gentlemen, we visited the doctor, and succeeded not only in obtaining several other teeth and bones of this animal, but nearly one entire tusk, and immediately alongside of the tusk discovered the fragment of pottery which I hold in my hand, and which is similar to that manufactured at the present time by the American Indians."[1] It would not be wise to found hasty theories on such strange juxtaposition of relics, possibly of very widely separated periods. The Ashley River has channeled for itself a course through the eocene and post-pliocene formations of South Carolina, and where these are exposed on its shores the fossils are washed from their beds, and become mingled with the remains of recent indigenous and domestic animals, and objects of human art. But the discovery of Dr. Klipstein was made in excavating an undisturbed, and geologically speaking, a comparatively recent formation. The tusk of the mastodon lay alongside of the fragment of pottery, in a deposit of the peat and sands of the post-pliocene beds. Immediately underneath lie marine deposits, rich with numerous and exceedingly varied groups

[1] *Proceedings, Academy of Natural Sciences, Philadelphia*, July 1859, pp. 178, 186.

of mollusca, corresponding to the recent species now living on the sea-coast of Carolina, but also including two fossil species no longer to be met with there, though common in the Gulf of Mexico and the West Indian seas.

Here too, in such singular juxtaposition, the palæontology of the New World discloses to us types of a fauna pertaining to its latest transitional period, which serve to illustrate the marvellous contrast between its commencement and its close. Until the recent discovery of teeth of the megatherium in the post-pliocene bed of the Ashley River, remains of that extinct mammal had been found only in the state of Georgia, in North America, while the *Mastodon Ohioticus* and *Elephas primigenius* are already among the well-known fauna of the Canadian drift. Of these, some North American localities have furnished the remains in remarkable profusion, but none more so than the celebrated morass in Kentucky, known by its homely but most expressive name of the Big-bone Lick. Imbedded in the blue clay of this ancient bog, entire skeletons, or detached bones, of not less than one hundred mastodons and twenty mammoths, have been found, besides remains of the megalonyx and other extinct quadrupeds. A magnificent skeleton of the *Mastodon Ohioticus*, now in the British Museum, was discovered, with teeth and bones of many others, near the banks of La Pomme de Terre, a tributary of the Osage River, Missouri; and there once more we seem to come upon contemporaneous traces of man. "The bones," says Mantell, who examined them in the presence of Mr. Albert Koch, their discoverer, "were imbedded in a brown sandy deposit full of vegetable matter, with recognisable remains of the cypress, tropical cane, and swamp-moss, stems of the palmetto, etc., and this was covered by beds of blue clay and gravel to a thickness of about fifteen feet. Mr. Koch states, and he personally

assured me of the correctness of the statement, that an Indian flint arrow-head was found beneath the leg-bones of this skeleton, and four similar weapons were imbedded in the same stratum."[1] Another remarkable account preserved in the *American Journal of Science*, describes the bones of a mastodon, with considerable portions of the skin, found in Missouri, associated with stone spear-heads, axes, and knives, under circumstances which suggest the idea that it had been entangled in a bog, and there stoned to death and partially consumed by fire.[2] Such contiguity of the works of man with those extinct diluvial giants, warns us at least to be on our guard against any supercilious rejection of indications of man's ancient presence in the New World as well as the Old. If the evidence is inconsequential or untruthful, future discoveries will not fail to bring it to nought; if, on the contrary, it involves glimpses of an unseen truth, no organized scepticism will prevent the ultimate disclosure of its amplest revelations.

As with the perished herd of the Irish fossil elk in the Curragh bog, the remains of the American mastodon have been repeatedly found as if they lay undisturbed since the death of the extinct giant. None of their bones recovered from the Big-bone Lick appear to have been rolled or exposed to friction; while others, discovered at the great Osage, which runs into the Missouri, a little above its confluence with the Mississippi, were in a vertical position, as if the animal had been engulfed in the mud. Whether or not those huge mammals had been known to man, during his occupation of the American continent, as his living contemporaries, their remains were objects of sufficiently striking magnitude to awaken the curiosity even of the unimpressible Indian; and tra-

[1] Mantell's *Fossils of the British Museum*, p. 473.

[2] *American Journ. of Science and Arts*, vol. xxxvi. p. 199, First Series.

ditions were common among the aborigines of the forests relative to the existence and destruction of the strange monster, whose bones lie scattered over the continent from Canada to the Gulf of Mexico. M. Fabri, a French officer, informed Buffon that they ascribed these bones to an animal which they named the *Père aux Bœufs*. Among the Shawnees, and other southern tribes, the belief was current that the mastodon once occupied the continent along with a race of giants of corresponding proportions, and that both perished together by the thunderbolts of the Great Spirit. Another Indian tradition of Virginia told that these monstrous quadrupeds had assembled together, and were destroying the herds of deer and bisons, with the other animals created by the Great Spirit for the use of his red children; when he slew them all with his thunderbolts, excepting the big bull, who defiantly presented his enormous forehead to the bolts, and shook them off as they fell, until, being at length wounded, he fled to the region of the great lakes, where he is to this day.

The first notice in an English scientific journal, of the fossil mammals of the American drifts, furnishes such a counterpart to the Shawnee traditions of the extinct giants of the New World, as might teach a lesson to modern speculators in science, when it is borne in remembrance that the difficulty now is to reconcile the discovery of works of human art alongside of the fossil mammals of the drift. In 1712, certain gigantic fossil bones, which would now most probably be referred to the mastodon, were found near Cluverack, in New England. The famous Dr. Increase Mather soon after communicated the discovery to the Royal Society of London; and an abstract in the Philosophical Transactions duly sets forth his opinion of there having been men of prodigious stature in the antediluvian world, as proved by

the bones and teeth, which he judges to be human, "particularly a tooth, which was a very large grinder, weighing four pounds and three quarters, with a thigh-bone seventeen feet long."[1] They were doubtless looked upon with no little satisfaction by Dr. Mather, as a striking confirmation of the Mosaic record, that "there were giants in those days." To have doubted the New England philosopher's conclusions might have been even more dangerous then, than to believe them now. Possibly, after the lapse of another century and a half, some of our own confused minglings of religious questions with scientific investigations will not seem less foolish than the antediluvian giants of the New England divine.

In all that relates to the history of man in the new world, we have ever to reserve ourselves for further truths. There are languages of living tribes, of which we have neither vocabulary nor grammar. There are nations, of whose physical aspect we scarcely know anything; and areas where it is a moot point even now, whether the ancient civilisation of central America may not be there a living thing. The ossiferous caves of England have only revealed their wonders during the present century, and the works of art in the French drift lay concealed till our own day. We cannot, therefore, even guess what America's disclosures shall be. Discoveries in its ossiferous caverns have already pointed to the same conclusions as those of Europe. A cabinet of the British Museum is filled with a valuable collection of fossil bones of mammalia, including those of the scelidotherium, glyptodon, and chlamydotherium, as well as of extinct carnivora, obtained by Dr. Lund and M. Claussen from certain limestone caverns in the Brazils, closely resembling the ossiferous caves of Europe. The relics were imbedded in a reddish coloured loam, covered over with a thick stalag-

[1] *Philosophical Transactions*, vol. xxiv. p. 85.

mitic flooring; and along with them, in the same ossiferous bed, lay numerous bones of genera still inhabiting the continent, with shells of the large *bulimus*, a common terrestrial mollusc of South America. No clear line of demarcation can therefore be traced here between the era of the extinct carnivora and edentata, and those of existing species, and there is therefore no greater cause of wonder, than in the analogous examples of Europe, to learn that in the same detritus of these Brazilian caves, Dr. Lund found relics of human skeletons, which, from their condition and the circumstances in which they were discovered, he was led to conclude belonged to an ancient tribe coeval with some of the extinct mammalia. Nor have the first disclosures of works of art in the American drift still to be made. I have in my possession an imperfect flint knife, an unquestionable relic of human art, given me by P. A. Scott, an intelligent Canadian, who found it at a depth of upwards of fourteen feet, among the rolled gravel and gold-bearing quartz of the Grinell Leads, in Kansas Territory, while engaged in digging for gold. The spot is in the Blue Range of the Rocky Mountains, in an alluvial bottom, and distant several hundred feet from a small stream called Clear Creek. A shaft was sunk, passing through four feet of rich black soil, and below this, through upwards of ten feet of gravel, reddish clay, and rounded quartz. Here the flint implement was found, and its unmistakably artificial origin so impressed the finder, that he secured it, and carefully noted the depth at which it lay.

Such then are some of the indications of the earliest appearance of man in that transitional era, during which the earth was undergoing its final preparation for his presence, as a being endowed not only with the highest form of organic life, but with a rational soul and an immortal spirit. The evidences of his ancient presence on

the American continent, accord with the proofs furnished by the multitude of independent languages, and the diversity of types of race, ranging from the Arctic circle to the most southern cape of Terra del Fuego. But it would be rash to assume from the partial evidence yet obtained, that the juxtaposition of the flint arrow-heads with the mastodon of Missouri, the pottery with the bones and tusk of the same animal in the post-pliocene of South Carolina, the human bones in the rich ossiferous caverns of the Brazils, or the flint implement recovered from the drift of the Rocky Mountains, are unquestionable evidences of man's existence on the American continent contemporaneously with the extinct mastodon or megatherium. Antiquaries of England, and still more of the continent of Europe, having found tobacco-pipes of the sixteenth and seventeenth centuries on Roman sites, along with pottery and other undoubted remains of Roman art, have hastily concluded that the peculiar American custom of tobacco-smoking was a classical institution; and on the like evidence it might be carried into far remoter ages. One example, specially noted, records the discovery of a tobacco-pipe, in sinking a pit for coal at Misk, in Ayrshire, after digging through many feet of sand. On evidence not greatly more conclusive, a New Orleans essayist conceives himself justified in announcing the startling statement, that "from these data it appears the human race existed in the delta of the Mississippi more than 57,000 years ago."[1] On the contrary, even the startling disclosure of works of art in the drift of France and England, whatever may be the precise antiquity they are finally destined to indicate, still point to man as the latest among the works of creation. But looking at the primeval traces of man in another aspect, they all concur in indicating his earliest arts to

[1] Dr. Bennet Dowler, *Types of Mankind*, p. 272.

have been of the most primitive kind, and in confirming the idea that our modern standards of mechanical and artistic ingenuity are not to be accepted as the sole tests of his intellectual development. They show also that we can no longer conceive of him as the occupant, until recent historic times, of one little central cradle-land, but must recognise in such widely diffused relics of primeval art in periods so remote, indications of the dispersion of the human family at the earliest times "when men began to multiply on the face of the earth." The brevity of the comprehensive narrative contained in the introductory chapters of Genesis helps to exclude from the minds of ordinary readers any just estimate of the extent of time that it embraces; and conflicting versions lend additional countenance to long-cherished doubts as to whether the received chronology, deduced from their genealogical data, does not greatly abridge the actual antediluvian human era. But even at the lowest computation, the interval between the creation of man and the deluge was not very much less than the whole Christian era; it was longer than the whole mediæval period marked by the rise of Mahometanism, Feudalism, and the Crusades; and the brief interval since the discovery of North America, during which our little insular Britain has proved the nursery of nations, is little more than a third of the allotted years of one of the antediluvian patriarchs. That throughout the whole of that period the human family continued to cluster around one central nucleus of its old eastern birth-land is a wholly gratuitous assumption. Centuries before the Babel builders were foiled in their ambitious plans, men may have been scattered abroad upon the face of all the earth. Many readers have been charmed by the graphic and beautiful scene in which Hugh Miller calls up before the mind's eye the supposed phenomena of the deluge, as limited to a com-

paratively circumscribed area; for, as he says, "It is not in the least a matter of moral significancy whether or no the deluge by which the judgment was effected covered not only the parts of the earth occupied by man at the time, but extended also to Terra del Fuego, Tahiti, and the Falkland Islands." But, probably more have been charmed than convinced by the eloquent ingenuity alike of his "Mosaic vision" and "Noachian deluge." And now that it seems almost certainly demonstrable on archæological, and also on geological grounds, that the human family was widely dispersed over the face of the earth at the earliest possible date at which we can reconcile chronologies of science and revelation, possibly some may be tempted to return to their old convictions, that when "all the fountains of the great deep were broken up, and the windows of heaven were opened, and the rain was upon the earth forty days and forty nights; and the waters prevailed exceedingly upon the earth; and all the high hills that were under the whole heaven were covered," that it actually was so. In reality, however, we must be content meanwhile to accept some only of the most obvious deductions from what are as yet but partial glimpses of a half-revealed truth.

CHAPTER V.

THE PROMETHEAN INSTINCT: FIRE.

No incident attending the discovery of the New World is more significant than the simple evidence which first satisfied Columbus that his trackless path into the mysterious western ocean had not been in vain. The sun had once more descended beneath the waves as Columbus took his station on the poop, and his eye ranged along the dark horizon, when suddenly a light glimmered in the distance, once and again reappeared to the eyes of Pedro Gutierrez, and others whom he summoned to confirm his vision, and then darkness and doubt resumed their reign. But to Columbus all was clear. Not only did these flitting gleams of light reveal to him certain signs of the long-wished-for land; they told him no less clearly that the land was inhabited. There is something singularly significant in the old Greek myth which represents the Titanic son of Iapetus stealing the fire of Zeus that he might confer on the human race a power over the crude elements of nature. Man is peculiarly fire-using. The element which becomes in his hands a power that controls all the others, and subjects them to his use, is an object of dread to the lower animals, alike amid arctic snows and the shadows of a night-camp in the tropics. The practice of fire-using is, moreover, so universal that it may be regarded as one of the primitive instincts of

man. It is not indeed an indispensable assumption that man was from the first familiar with its use, or had devised for himself the art of producing fire. On the contrary, his supposed ignorance, during the primitive ages of the world, of this important achievement of human intelligence, has been employed as an argument in confirmation of the fact that the cradle-land of the human race must have been situated in a climate where his unclothed body experienced no discomfort in the changing seasons, and food was found in sufficient abundance to supply all his wants without being subjected to artificial preparation. The more elevated regions of the tropics appear to supply those requisite conditions alike in the Old and New World; and the traces, in the primitive arts of the stone-period, of a condition in the early stages of many nations, during which the simplest application of fire for any purposes of metallurgy was unknown, has been thought to confirm the idea that lengthened periods elapsed before man acquired the art of producing fire. M. Flourens, in reasoning on the age of man, affirms that his primitive, natural, and instinctive diet is frugivorous; and from this he also infers that his original habitat was in warm climates, where fruit is abundant at all seasons. But such a condition of life was incompatible with the diffusion of man beyond the extremely limited regions which supply those requisites of primitive life. Human intelligence accordingly achieved the art of producing fire, and learned its many uses. By its means both vegetable and animal productions could be adapted to his wants and tastes; and thus, by the introduction of the art of cooking, man acquired an artificial and omnivorous diet.[1] When, however, we turn to the sacred narrative for the first glimpses of the condition of

[1] Flourens, *De la Longévité Humaine*, p. 127.

primeval man, we find Abel laying the firstlings of his flock on the altar of sacrifice; as once more, when an undeluged world became the new theatre of human life, burnt-offerings smoked on the altar, and the sweet savour of a typical sacrifice rose up with the ascending flames, while the covenant of earth's harmonious cycles and seasons was guaranteed to man.

The wide interval which separates man from the lower animals is scarcely less strikingly manifest when we draw the comparison between them and the most degraded savage, than when we contrast the wondrous operations of animal instinct, with the most matured achievements of human intelligence. It is the interval between instinct and reason, which we cannot measure from clearly defined points where we can assuredly say the domain of the one ends and the other assumes its place; but the distinctions between which we cannot mistake, in the unerring but unprogressive rectitude of instinctive skill, and the erring, blundering, and wayward, but tentative and finally progressive efforts of experience and reason. We wonder at the Grave Creek Mound, an artificial earth-pyramid of seventy feet in height, wrought by the concerted labour of man in America's prehistoric times; and the great pyramids of Gizeh, most stupendous among the structures that human labour has ever accomplished, have been ranked among the world's wonders from the age of Herodotus to our own. But what are the largest of those works of which man is vain compared to the ant-hills of tropical countries, twelve and fifteen feet high, which, in comparison with their builders, are as if men were to make a building the height of the Andes or Himalaya mountains.[1] In his savage state, indeed, "from nature rising slow to art," man appears at each succeeding step

[1] Brougham's *Dialogues on Instinct*, p. 100.

but as the pupil and poor imitator of instinctive skill, with blunted perceptions and a scantily developed imitative faculty obeying the voice of nature :—

> "Go, from the creatures thy instruction take :
> Thy arts of building from the bee receive,
> Learn of the mole to plough, the worm to weave ;
> Learn of the little nautilus to sail,
> Spread the thin oars, and catch the driving gale ;
> Here too all forms of social union find,
> And hence let reason, late, instruct mankind."[1]

Yet when we have exhausted all our admiration of the inimitable arts of the bee, the ant, the spider, and silkworm ;- or even of that which we recognise as intelligence in the dog, the fox, the horse, or the elephant : we are nevertheless as fully prepared as ever to concur in the decision of Columbus that the flaming night-torch of the Guanahanè savage was indisputable evidence that the unknown world which dawn was about to reveal was the habitation of man.

The lowest form of humanity, alike intellectually and physically, has been thought to be found among the Australian aborigines, yet there human intelligence had achieved the discovery which lies at the very foundations of all possible civilisation ; though it may be accepted as a proof of his degraded intellectual condition, that of the gift which the ancient Greek believed to have been stolen from heaven, the Australian is content to trace the derivation from the bandicoot, a small, sharp-nosed animal, not unlike the Guinea pig. According to the inconsequential account furnished by a native Australian of the first acquisition of fire by man :— "A long, long time ago a little bandicoot was the sole owner of a fire-brand, which he cherished with the greatest jealousy, carrying it about with him wherever

[1] Pope's *Essay on Man*, Epistle III.

he went, and never allowing it out of his own special care; so selfish was he in the use of his prize, that he obstinately refused to share it with the other animals, his neighbours; and so they held a general council, where it was decided that the fire must be obtained from the bandicoot either by force or strategy. The hawk and pigeon were deputed to carry out this resolution; and after vainly trying to induce the fire-owner to share its blessings with his neighbours, the pigeon, seizing, as he thought, an unguarded moment, made a dash to obtain the prize. The bandicoot saw that affairs had come to a crisis, and, in desperation, threw the fire towards the water, there to quench it for ever. But, fortunately for the black man, the sharp-eyed hawk was hovering near the river, and seeing the fire falling into the water, he made a dart towards it, and with a stroke of his wing knocked the brand far over the stream into the long dry grass of the opposite bank, which immediately ignited, and the flames spread over the face of the country. The black man then felt the fire, and said it was good."[1]

The discovery of the art of producing fire by artificial means may be considered as one of the earliest achievements of the untutored intellect of man; and as this is effected among various tribes in diverse ways, it may supply one clue whereby to trace affinities among tribes widely separated, in so far as the process pursued is independent of any special local peculiarities. The docile service of fire is one of the very first means by which man achieves his triumphs over nature. With its aid his range is no longer limited to latitudes where the spontaneous fruits of the earth abound at every season. The use of fire lies at the root of all the industrial arts. The friendly savages found by Columbus on the first-

[1] Mr. James Browne, *Canadian Journal*, vol. i. p. 509.

discovered island of the New World were armed with mere wooden lances, hardened at the end by fire. The most civilized among the nations conquered on its soil by Cortes and Pizarro, had learned by the same means to smelt the ores of the Andes, and make of their alloys the tools with which to quarry and hew their rocks, to sculpture the statues of the gods of Anahuac, and the palaces and temples of the Peruvian children of the sun. Without fire the imperfect implements of the stone-period would be altogether inadequate to man's necessities. By its means he fells the lofty trees, against which his unaided stone-hatchet would be powerless, and he must have been left to gaze with envy on the superior skill of the beaver's woodcraft. It plays a no less important part in preparing the log-canoe of the savage, than in propelling the wonderful steamship, by means of which the great lakes and rivers of the New World have become the highways of migrating nations. Yet fire is not an indispensable thing. Men have lived in ignorance of the power that lay within their reach, or of the means of calling forth this fire-demon, when known to them, and making him their obedient slave. The islanders of the Ladrones, discovered by Magellan in 1521, could not have been in ignorance of fire, for their islands are mostly of a volcanic character, and, like the Terra del Fuego of the same discoverer, their volcanoes have been in activity in modern times; yet the savages of the Ladrones, according to some of the early Spanish voyagers, thought fire, which they had never seen before, a devil or god that bit fiercely when it was touched, and lived on wood, which they saw it devour.

The fire-worship of the Ghebirs is but a degraded form of that homage to visible divinity with which man worships the glorious god of day, and bows down before the heavenly host. Among the Aztecs and the Peruvians,

the civilized nations of the New World, accordingly, a peculiar sanctity was associated with the familiar service of fire. At the close of the great cycle of the Aztecs, when the calendar was corrected to true solar time, at the end of the fifty-second year, a high religious festival was held, on the eve of which they broke in pieces their household gods, destroyed their furniture, and extinguished every fire. In the reconstruction of the ritual calendar which then took place, the intercalated days were regarded as belonging to no month or year. They were held as though non-existent, and were dedicated to no gods, on which account they were reputed unfortunate. It was a period of fasting and penitence, during which no fire smoked, and no warm food could be eaten throughout the whole land. At the close of that dreary interval, during which they dreaded the final extinction of the sun, the ceremony of the new fire was celebrated. After sunset the priests of the great temple went forth to a neighbouring mountain, and there, at midnight, the sacred flame was rekindled, which was to light up the national fires for another great cycle. The process by which the fire was procured, by revolving one piece of dry wood in the hollow of another, is repeatedly illustrated in the Mexican paintings of Lord Kingsborough's great work. But, true to the bloody rites of the national faith, the fire on this sacred festival was kindled on the breast of a human victim, from whence the reeking heart was immediately afterwards torn out, and cast as a bloody offering to the gods. The period from the extinction to the rekindling of the sacred fire was one of great suspense. With a superstitious feeling, strikingly in accordance with the customs and ideas of the northern Indians, the women remained confined to their houses, with their faces covered, under the belief that if they witnessed the ceremony they would be forthwith trans-

formed into beasts. Meanwhile, the men gathered on the terraced roofs, and looked forth in dread suspense into the darkness. The flames on the summits of the great teocallis, which lighted up the city at all other seasons, had been extinguished; and if the priests failed to rekindle them, it was believed that the night must be eternal, and the world would come to an end. But dimly, through the darkness, a spark was seen to glimmer on the summit of the distant mountains, and from thence it was swiftly borne to the great temple, towards which the gladdened worshippers turned with renewed hope. As the sacred flame again blazed up on the high altar, and was distributed to the other teocallis, and thence among the people at large, shouts of joy and triumph ascended with it to the sky. Feasts, joyous processions, and oblations at the temples, were prolonged through a festival of thirteen days, devoted to a national jubilee for the recovered flame, the type of a regenerated world.[1] The long interval which transpired between this closing rite of the great cycle was of itself sufficient to give it an impressive sanctity in the eyes of the Aztec worshipper. He who witnessed it in youth saw it only once again as life drew towards a close; whilst few indeed of all who rejoiced at the renewed gift of fire could expect to look again on the strangely significant and awful rite. Compared with the annual miracle of the Greek Church in the crypt of the holy sepulchre, to which it bears some resemblance, the great festival of the Aztecs was replete with significance and solemn grandeur, though stained with the blood of their hideous sacrifices.

The Peruvian sun-worshippers preserved the harmony between their recurrent festivals and the true solar time, by a ruder process of adjustment than that which was

[1] *Clavigero*, vol. ii. p. 84.

devised by the remarkable proficiency of the Aztec priests in astronomical science. Nevertheless, they too had their great secular festival of Raymi, held annually at the period of the summer solstice. For three days previous a general fast prevailed, the fire on the great altar of the sun went out, and in all the dwellings of the land no hearth was kindled. As the dawn of the fourth day approached, the Inca, surrounded by his nobles, who came from all parts of the country to join in the solemn celebration, assembled in the great square of the capital to greet the rising sun. The temple of the national deity presented its eastern portal to his earliest rays, emblazoned with his golden image, thickly set with emeralds and other precious stones; and as the first beams of the morning were reflected back from this magnificent emblem of the god of day, songs of triumph mingled with the jubilant shout of his worshippers. Then, after various rites of adoration, preparations were made for rekindling the sacred fire. But this, with the Peruvians, was done by a process far in advance of that retained by the Aztec priests. The rays of the sun, collected into a focus by a concave spherical mirror of polished metal, were made to inflame a heap of dried cotton, and a llama was sacrificed as a burnt-offering to the sun. Only in the case of the sky being overcast did the priests resort to friction for rekindling the altar; but the hiding of his countenance on that occasion by the god of day was only regarded as less ominous than the extinction of the sacred fire, which it became the sacred duty of the virgins of the sun to guard throughout the year. A general slaughter of the llama flocks of the sun furnished a universal banquet; and, while the god was propitiated by offerings of fruit and flowers, there appear to have been some rare occasions on which the sacrifice of a human victim,—a beautiful maiden or a child,—gave to

this graceful anniversary a nearer resemblance to the appalling rites of Aztec worship.

Among the northern Indian tribes some faint traces of the annual festival of fire are discernible. At the sacrifice of the white dog, which was the New Year's festival and great jubilee of the Iroquois, the proceedings extended over six days; and such were the obligations which these rites imposed on all, that if any member of a family died during the festival, the body was laid aside, and the relatives participated in the games as well as the religious ceremonies. The strangling of the white dog destined for sacrifice was the chief feature of the first day's proceedings; while on the second the two keepers of the faith visited each house, after which it was open to all, and the significant ceremony of the day consisted in stirring the ashes on the hearth, accompanied with a thanksgiving to the Great Spirit. On the morning of the fifth day the white dog was offered up as a burnt-sacrifice. The fire was kindled by swiftly revolving, by means of a bow and cord, an upright shaft of wood with a perforated stone attached to it as a fly-wheel. The lower point rested on a block of dry wood surrounded by tinder, which was speedily ignited. This is the ordinary process still in use among many of the Indian tribes, and also by the Esquimaux. The flame being thoroughly enkindled, the sacrifice was borne in procession on a bark litter, until the officiating leaders halted, facing the rising sun, when the white dog was laid on the flaming wood and consumed, during a solemn address, which included a special thanksgiving to the sun, for having looked on the earth with a beneficent eye.[1]

There is, perhaps, no connexion traceable between the various rites and services thus described; for it would

[1] *League of the Iroquois*, pp. 207-221.

be easy to find their parallels among many ancient and modern tribes and nations. They pertain to the religious practices of the ancient Chaldeans, to the rites of Baal, and to the earliest and simplest forms of idolatry. Sabaism is indeed the most natural, and at the same time the most elevated form of false-worship, commending itself by many visible tokens, as of a divine influence and power, to uninstructed man; and the association of fire with the sun as its source is scarcely less natural. "Take ye good heed unto yourselves," exclaims the lawgiver of Israel to the tribes in the wilderness, "for ye saw no manner of similitude on the day that the Lord spake unto you in Horeb out of the midst of the fire; lest thou lift up thine eyes unto heaven, and when thou seest the sun, and the moon, and the stars, even all the host of heaven, shouldest be driven to worship them." This worship of the sun, though associated with the ancient rites of Asiatic nations, is not therefore necessarily an evidence of the eastern origin either of the faith or the nations of the New World. But, in the services to which it gave rise there, we have, at least, suggestive hints of the links that bind together its own ancient and modern tribes; and perhaps some clue also to the interpretation of the obscure sculptures, with their mysterious hieroglyphics, still remaining on the sites of the extinct native civilisation of America; and of the strange rites once practised amid the sacred enclosures and altar-grounds which give such peculiar interest to the river-terraces of the Mississippi valley. Among the remarkable structures of the ancient Mound-Builders, which will come under review in a subsequent chapter, their explorers have been struck by the peculiarities of a certain class of mounds, erected on the most elevated summits of the outlying hills. Concerning these "there can be no doubt that the

ancient people selected prominent and elevated positions upon which to build large fires, which were kept burning for long periods, or renewed at frequent intervals. The traces of these fires are only observed upon the brows of the hills; they appear to have been built generally upon heaps of stones, which are broken up and sometimes partially vitrified. In all cases they exhibit marks of intense and protracted heat."[1] It has been attempted to account for these as signal-stations by a reference to the primitive telegraphic system still in use among the native tribes, of sending up columns of smoke as signals that enemies are at hand. Lieutenant Fremont, as he penetrated into the fastnesses of Upper California, where his presence excited great alarm, saw the fire-signal send up its column of smoke at scattered intervals; and the very same practice was noticed during the Canadian exploring expedition to the Assinaboine and Saskatchewan in 1858. But this "putting out fire," as it is called among the Indians of the northwest, for the purposes of signal, is accomplished by the simple process of setting the short-tufted buffalo grass in flame; and presents no analogy to the traces of intense fires on the ancient hill-mounds, where the amount of scoriaceous material often covers a large space several feet deep. Fire, as we shall see, was extensively used in the sacred as well as the sepulchral rites of the Mound-Builders. Their strange buried altars have glowed repeatedly with the sacred fires, and consumed the offerings of their most costly treasures, ere they were finally covered up, to lie concealed during the long night of intervening centuries. Accompanied as they are by traces suggestive of the probability of human sacrifices, they present analogies to the cruel worship of the Phœnician and Carthaginian Baal, whose temples and altars

[1] *Ancient Monuments of the Mississippi Valley*, p. 183.

were chiefly built on the tops of hills, or on the summits of artificial piles. That the Phœnicians and Syrians worshipped the sun is directly stated by Herodian, and confirmed by the occurrence of the name of Baal with that of the sun on Carthaginian coins and Palmyrene inscriptions, as *Baal-chamman, Baal-shemesh, Baal-shamayim.* But there is no need to assume the presence of Phœnician voyagers and colonists in the New World, to account for the origin of rites and practices which rather point to that essential unity, throughout the whole family of nations, traceable in the independent origin of the same practices, and the instinctive development of like arts and customs wherever man is found subject to corresponding influences.

Perhaps greater importance is due to the abundant proofs of the employment of the very same method of fire-making at the present day among the Indians of the north-west, as we see illustrated in the ancient Aztec paintings; while the sun-worshippers of the southern continent had devised a totally distinct method, and one corresponding to that by which the ancient Romans kindled the sacred fire. Mr. Paul Kane thus describes the process employed by the Chinooks on the Columbia River. "The fire is obtained by means of a flat piece of dry cedar, in which a small hollow is cut with a channel for the ignited charcoal to run over; this piece the Indian sits on to hold it steady, while he rapidly twirls a round stick of the same wood between the palms of his hands, with the point pressed into the hollow of the flat piece. In a very short time sparks begin to fall through the channel upon finely frayed cedar-bark placed underneath, which they soon ignite. There is a great deal of knack in doing this, but those who are used to it will light a fire in a very short time. The men usually carry these sticks about with them, as

after they have been once used they produce the fire more quickly."[1] The *punk* employed in the similar process of the Iroquois, and in constant use with the flint and steel, by the Backwoodsman, is a species of fungus which grows on the maple. Another fungus, of inferior quality, found on the birch, is made use of when the other cannot be procured. When lighted by a spark, either from a flint and steel, or by means of friction, the punk smoulders but will not burst into a flame. It is therefore wrapped in a quantity of cedar bark, wrought in the hand to the consistency of tow, which readily ignites. The method of procuring fire among the Dacotahs or Sioux is thus described by Philander Prescott, an Indian interpreter:—"A piece of wood was squared or flattened so as to make it lie steadily, a small hole was commenced with the point of a stone, then another small stick was made, round and tapering at one end. This end being placed in the hole, the Indian put one hand on each side of the round stick and commenced turning it as fast as possible, back and forward. Another held the wood with one hand, and a piece of punk in the other, so that when there was the least sign of fire, he was ready to touch the punk, and put it when ignited into a bunch of dry grass that had been rubbed fine in the hands." With slight variations in the application of the principle, this appears to be the recognised Indian mode; and there is no question that among all the Indian tribes not only was a certain superstitious sanctity attached to fire, but they look with some distrust on the novel methods employed by Europeans for its production. Among the Dacotahs, as with other tribes, at the recurrence of certain sacred feasts, all the fires are extinguished, and the ashes removed from the lodge, and no food is taken

[1] *Wanderings of an Artist among the Indians of North America*, p. 188.

until the fires have been rekindled, with many minute rites and observances. The Indian council-fire is also lit on certain great occasions, with ceremonies that have some remote resemblance to those of the Mexican sun-worship; and the peculiar significance which attaches to the council-fire is aptly illustrated by the name of the Pottawattomies or fire-makers, a nation of the Algonquin stock. They received this name from the jealousy of their rivals, who thereby intimated that they were severers of the unity of the Algonquin nation, as a people who were setting up an independent government, and kindling their own council-fire. When, in 1811, Elksatowa, the prophet of the Wabash, and the brother of Tecumseh, the Shawnee warrior, was exhorting his tribe to resist the deadly encroachments of the white man, he concluded one of his eloquent warnings by exclaiming, "Throw away your fire-steels, and awaken the sleeping flame as your fathers did before you; fling away your wrought coverings and put on skins won for yourself as was their wont, if you would escape the anger of the Great Spirit." Nor is there wanting among many Indians a conviction that the Ishkodaiwaubo, or fire-liquid, is a malignant form of the same mysterious element, an evil medicine wrought for their destruction by the white Manitou. But the fire-steel, which the Shawnee orator associated with the foreign novelties distasteful to the Great Spirit, is a native product in use among the Fuegians in the far southern Terra del Fuego, or so-called Land of Fire. There Dr. Pickering found the Magellanic watermen, as he styles them, occupying a coast indented with a labyrinth of sounds and channels, which afford unusually favourable opportunities for the development of maritime skill. But their canoes are smaller and inferior in construction to those of the northern shores, and they neither

venture into the open sea, nor attempt the easy passage to the neighbouring Falkland Islands. The rude hut of the Fuegian corresponds with his canoe. In shape it is hemispherical, having the apex unfinished for the escape of smoke. A heap of mussel and limpet shells uniformly encumber the entrance, and indicate the principal food of its architect; and the only footpath traceable led from the rude hut to the water's edge. As Dr. Pickering observes: the face of nature has there undergone no change from the presence of man; and he adds, "by what means the Fuegians procure fire, so precious in this chilly and humid climate, I am uninformed; but the process would seem to be difficult, since they are careful always to take a supply in their canoes." This, however, an earlier voyager had already noted. At Terra del Fuego, Weddell produced the tinder-box in presence of a party of Fuegians, in order to ascertain how fire is produced by them, and presently he discovered that his steel had been purloined by one of the party. This however he recovered, and after sending the culprit to his canoe with threats of punishment, he learned that they procure fire by rubbing iron pyrites and a flinty stone together, catching the sparks in a dry-substance resembling moss, which is quickly ignited.[1]

Thus we trace throughout the western hemisphere various methods for calling into existence the wondrous element, so peculiarly distinctive of man. Even in the simple processes employed, traces of certain common relations of a very wide embracing character are apparent; while the Peruvian, with his solar mirror, stands apart alike from the rude forest Indian and the cultivated native of the Mexican plateau; and far to the south of both, the rude Fuegian finds in the natural products of

[1] Weddell's *Voyage towards the South Pole in* 1822-24, p. 167.

his inhospitable clime, a means of fire-making analogous to that which the Shawnee prophet taught his people to regard as one of the unhallowed practices of the white man.

The rude Indian of the forests and islands of the New World has learned for himself that grand invention of *fire*, which lies at the root of all arts, and is the true Tubal-Cain, Hephæstos, Vulcan, and Wayland Smith; the Quetzalcoatl, divine instructor of the Aztecs in the use of metals, and in other arts; and the Manco Capac, child of the sun, with his golden wedge, the germ of all Peruvian civilisation. He had made slave of the heaven-born element, the brother of the lightning, the grand alchymist and artificer of all times, though as yet he knew not all the worth and magical power that was in him. By his means the sturdy oak, the birth of centuries, which flung abroad its stalwart arms, and waved its leafy honours defiant in the forest, was made to bow to the behest of the simple Aborigines. The massive trunk shaped itself into a canoe, hollowed out by the magical touch of this artificer. The clay, kneaded into the simple gourd-like caldron or jar, became the parent of all later ceramic art; or burnt into the builder's brick gave birth to all triumphs of architecture. Copper, the Peruvian *Anta*, which is supposed to have given name to the South American Cordilleras, where it is found native in as rich abundance as along the shores of Lake Superior, and which had appeared but a ductile stone: became liquid as the limpid streams born of the snows of the copper-bearing Andes, and took shape of use or beauty at the will of the ingenious modeller. The white tin, pliant and of little account, assumed a new power in the hands of the metallurgist, and wedded to the soft and ductile copper, produced the beautiful and useful alloy which marks the grand transitional eras of the Old

World as well as the New: the symbol of that age of bronze which mingles in the dreams of Hesiod's Theogony, and illumines the dawn of the prehistoric centuries of Scandinavia and Britain. Nor could poet long for a more suggestive allegory than that of bronze, the many-gifted daughter of copper and tin, tracing back her ancestry to the Cyclopean sons of Uranos, the fabricators of the thunder of Zeus. But the magic power of the heaven-descended artificer was seen only in its infantile sports, when such feats had been accomplished. The iron ore lay in mountain heaps, a dark, unsightly, and inert mass; and alongside of it, in many contemporaneous strata of the carboniferous period, the fire-heat of centuries long buried in the forgotten eras of geological time had been compacted into vegetable coal. The gymnosperms, equisetaceæ, and sigillaria, the gigantic ferns and palms of palæozoic epochs, had been compacted into fuel, and buried there to await the uncreated intelligences of coming time. And now *fire* was to accomplish its triumphs, and make the great levels and grand river-courses of the New World the scenes of a revolution unequalled since time itself was born. Coal and iron are wedded together. The new forgers of the thunderbolts toil in the roaring forges of Birmingham, Glasgow, Wolverhampton, and Woolwich. Watt, Arkwright, Brunel, Stephenson, are the new Tubal-Cains and Wayland Smiths of our modern age. The Atlantic is bridged by their ocean steamers; and, where the genius of Europe's solitary believer in a Far West guided the caravels of Spain through the dread mysteries of the ocean to another world beyond: the merchant navies of the nations speed, defiant of wind and waves, propelled by new powers that slumbered, abiding their waking time, in that tiny spark lit by the forest-Prometheus. Tended by this willing slave, mechanic skill toils, throbbing and panting,

yet unwearied, at its great task. The work of old centuries is outsped in single years. Everywhere, and in all shapes, the new developments of this primitive element of science startle us with their novel and exhaustless powers :—

> "The labouring fires come out against the dark,
> Innumerable furnaces and pits,
> And gloomy holds, in which that bright slave, Fire,
> Doth pant and toil all day and night for man." [1]

In elder times that seem to us now as though they were before the very days of old, but in which, even then, it was said, "the place where we dwell is too strait for us," a band of pioneers went forth into the wilderness, and with their axes hewed down the forests, even as now in America's far west, to make for themselves a place where they might dwell; and there Elisha, the Israelitish prophet, put forth his power, and the waters of the Jordan gave back the axe of the woodman, and "the iron did swim."[2] But now amid the blast and the roar of a hundred forges, and the clang of a thousand sledge-hammers, there rises on the banks of the Thames an iron ship, vast in its proportions as the ark that rested of old on the peak of Ararat, freighted with the life of the emerged world. The huge leviathan grows apace, with strange toils, whereat the world looks on in suspense. Its vast bulk is thrust into the waters, and the mighty hulk of iron swims. The great fire-powers contribute their engines, evolve their new ally, steam, and, breasting the waves of the Atlantic, the iron ship, that could carry a whole fleet of the tiny caravels of Columbus, moves proudly westward till it drops anchor in the waters of the Hudson. And at the very time when thousands crowd to gaze on the vast leviathan

[1] Alexander Smith, *Drama of Life*.

[2] 2 Kings vi. 6.

that commerce has thus commissioned to follow in the wake of the old Santa Maria of Palos; and while there lies inert beneath its keel the dumb Atlantic cable, yet destined, we trust, to annihilate time and space with the aid of new forms of the ethereal fire: the fleets of England are bearing the heir of her crown to inaugurate the Victoria Bridge, another of the triumphs of mechanical power and genius, spanning the broad St. Lawrence with its free highway, where once the little birch-bark of the Indian sufficed for all its traffic. For the great fire-slave has wrought out still other mighty elements of change. Northward, southward, and far into the wilds on the western horizon of civilisation, run the new iron highways, rush the new iron-horses, snorting and shrieking as they hasten onward to the Pacific, and pant till, with the ocean steam-ships of commerce, they shall engirdle the world.

Thus far has time already realized the fond dream of Columbus, which, as he believed, he read foretold in holy writ, and shadowed forth darkly in the mystic revelations of the prophets. The ends of the earth were to be brought together, and all nations, and tongues, and languages, united under the banners of the Redeemer.[1] Thus far also has experience confirmed his absolute deduction. That faint glimmering of light, seen once and again in passing gleams, was in reality the flashing of intellect in that still unrevealed world which was to gladden the weary eyes of the ocean-watchers with the morrow's dawn. The inhabitants of that western continent had already achieved the wondrous art of fire-making, and all else was conceivable of them. They were intelligent beings, fashioned in the same divine mould as those who then flattered themselves they were carrying the light of

[1] Washington Irving's *Life of Columbus*, book i. chap. v.

the true faith into benighted lands; men within whom lay, inert or in fullest vigour, the germs of all later triumphs of chemistry, electricity, mechanics: the steam-engine, the railway, the electric telegraph, and the greater, grander, mightier things than these that exist in undeveloped thought for the generations yet to be.

CHAPTER VI.

THE MARITIME INSTINCT: THE CANOE.

SPEECH is one of the instincts of man, but it is by the voluntary exercise of his intellectual faculties, as we conceive, that he is enabled to develop it into language; and by the accumulated wealth gathered from the experience of many generations that it becomes the comprehensive vehicle of thoughts that compass the bounds of his immortal destiny. Made, therefore, only "a little lower than the angels," and separated by an immeasurable interval from the inferior orders of being in which reason, mind, and will, are all controlled by an infallible but unprogressive instinct: it has seemed credible on various grounds, already set forth, that the chief occupation of man's primal integrity was in the exercise of that human instinct of speech, out of which language necessarily grew. Joy is ever vocal, and the clear virgin intellect, revelling in the world of wonders that burst on the delighted gaze, gave articulate utterance to the wondrous world of thought within.

If science can conceive of man, unendowed with the experience and the wisdom of ages, but dowered with intellectual and moral purity, — surely even for the theories of science not an impossible thing, — it may then picture to itself the crisis of that transitional period in which geology draws to a close, when

> There wanted yet the master-work, the end
> Of all yet done; a creature, who, not prone
> And brute as other creatures, but endued
> With sanctity of reason, might erect
> His stature, and upright with front serene
> Govern the rest, self-knowing."

"But man is not merely a reasoning animal, endowed with the instinct of speech. He is also a tool-using, or as Franklin defined him, a tool-making animal. Whilst, however, an innate instinct seems to prompt him to supplement his helplessness by means of the helpfulness of mechanical appliances: mechanical science, the industrial and the fine arts, are all progressive developments which his intellect superinduces on that tool-using instinct. And through all the countless ages revealed to the geologist, with ever new orders of successive life; with beast, bird, crustacean, insect, and zoophyte, endowed with wonderful constructive instincts, and perpetuating memorials of architecture and sculpture, of which the microscope is alone adequate to reveal the exquisite beauty and infinite variety of design: yet so thoroughly is the use of tools the exclusive attribute of man, that the discovery of a single artificial shaped flint in the drift or cave-breccia, is sufficient to lead the geologist to infer indisputably that man has been there. The flint implement or weapon lies beside bones revealing a kindred species to the sagacious elephant, or to those of carnivora allied to the dog, with its wonderful instincts bordering on reason and the forethought of experience; yet no theorist dreams of the hypothesis that some wiser *Elephas primigenius*, in advance of his age, devised the flint spear wherewith to oppose more effectually the aggressions of the abundant carnivora, the remains and traces of which, in the ossiferous caverns, have revealed to us the startling truth, that not only death, but also pain reigned from the first among inferior

orders of creation that "had not sinned after the similitude of Adam's transgression."

Man was created with a tool-using instinct, and with faculties capable of developing it into all the mechanical triumphs which not unreasonably command such wonder and admiration in our day; but he was also created with a necessity for such. "The heritage of nakedness, which no animal envies us, is not more the memorial of the innocence that once was ours, than it is the omen of the labours which it compels us to undergo. With the intellect of angels, and the bodies of earth-worms, we have the power to conquer, and the need to do it. Half of the industrial arts are the result of our being born without clothes; the other half of our being born without tools."[1]

With the growing wants of men as they gathered into communities, novel arts were developed; and the demands of each new-felt want called into being the means of its supply. Artificers in brass and iron multiplied, and the sites of the first cities of the earth were adorned with temples, palaces, sculptured marbles and cunningly-wrought shrines. But still it was the lot of the sons of Adam to journey from that old East. God scattered them abroad from thence upon the face of all the earth; and as they wandered, westward and eastward, the elements of an acquired civilisation were inevitably left behind; all but the most indispensable arts were lost during the process of migration, and when at length the wanderers found a new home, it might be "a land whose stones are iron, and out of whose hills thou mayest dig brass," but no arts so speedily disappear among migratory tribes as those of metallurgy. The hold of the accumulated wisdom and experience of successive generations

[1] *What is Technology: an Inaugural Lecture.* By George Wilson, M.D. Regius Professor of Technology, Edinburgh University.

must be partial and uncertain among an unlettered people, dependent on tradition for all knowledge excepting such as is practically transmitted in the operations of daily experience; for how very few of all the wanderers from the old centres of European civilisation to the wilds of the new world bring with them the slightest knowledge either of the science or the practice of metallurgy; or can tell how iron is taken out of the earth, and brass molten out of the stone, or even can distinguish the metallic ores. Every chemical analyst knows what it is to receive iron pyrites for silver, and ochres for iron or gold. Even now the skill of the American miner has to be imported, and the copper-miners of Lake Superior are almost exclusively derived from Cornwall or the mining districts of Germany.

With all our many artificial wants so promptly supplied, even in the remotest colony in which the nomade Anglo-Saxon wanders

> "By the long wash of Australasian seas
> Far off, and holds his head to other stars,
> And breathes in converse seasons,"

we are slow to perceive how much we owe to the wondrous appliances of modern civilisation, and its social division of labour. The old Dutchman exported his very bricks across the Atlantic, wherewith to found his New Amsterdam on the banks of the Hudson; and the English colonist, with enterprise enough to mine the copper veins of Lake Superior, still seeks a market for the ore in England, and imports from thence both the engineers and the iron wherewith to bridge his St. Lawrence. With such facts before us in relation even to the systematic colonization of a highly civilized and enterprising commercial nation: it is easy to understand what must have been the condition of the earth's primeval colonists, as they wandered forth successively from the great Asiatic

hive, gradually displacing the savage fauna of the unpeopled wilds they took possession of, or occupying, as chance directed them, the far-scattered islands of the sea. Their industrial arts were all to begin anew; and thus, wherever we recover traces of the first footprints of the old nomade in his wanderings across the continents of Asia or Europe, or follow him into the new world of America, or the newer continent of Australia and the islands of the Southern Ocean, we see that that non-metallurgic condition of primitive social life which is conveniently designated its stone-period, is not necessarily the earliest human period, but only the rudimentary condition to which man had returned, and may return again, in the inevitable deterioration of a migratory era. The world was all before him, where to choose his place of rest. Its forests had to be cleared, its fields to be tilled, its veins of copper to be explored, and the long lost science of metallurgy to be recovered, and developed anew into industrial arts. Cast once more on his primal tool-using instincts, we can nevertheless frequently trace the individuality of the workman, and the germs of original thought and the novel applications of inventive skill, even in such infantile human arts. What is frequently of still more importance to the ethnologist, we can not only detect in the workmanship some clue to the psychical character of the originator; but even more so, from the materials he employed, and the artistic efforts at imitation he displayed, we can infer his former geographical relations, and the physical conditions under which he wrought.

But all evidence consistent with the Adamic origin of man points to the cradle-land of the human family towards the western borders of Central Asia, and remote from its coasts: probably in that range of country stretching between the head waters of the Indus and the

Tigris. The only early history of man that we possess represents the postdiluvian wanderers journeying eastward, and at length settling on a plain that long afterwards remained one of the chief centres of history. But the arts there developed belonged exclusively to a far-inland people; and to this day the rude craft of the Tigris and the Euphrates betrays the total absence of maritime instinct or skill in navigation. The highest effort of their boat-builders is little more than to construct a temporary raft, on which themselves and their simple freight may float in safety down the current of the great river. It is the same device as Juvenal describes, evidently without having seen it, as the painted earthenware boat of the Egyptians of the Nile:—

> "Imbelle et inutile vulgus,
> Parvula fictilibus solitum dare vela phaselis,
> Et brevibus pictæ remis incumbere testæ."[1]

The "fictilibus phaselis" of the poet were in reality only the Nile rafts, such as are in use to this day, formed of earthenware jars bound together by withes and cords, and covered with bulrushes. Like the corresponding river-craft of the Euphrates, these are steered down the Nile, never to return; for, on their arrival at Cairo, the rafts are broken up, and the jars sold in the bazaars. Such was the rudimentary condition of navigation in that great Asiatic hive of nations, where man chiefly dwelt for centuries, remote from the sea. But from thence the wanderers were scattered over the face of the whole earth, and by them were the nations divided in the earth, and the isles of the Gentiles divided in their lands. The primitive river-craft, therefore, found an early development into sea-craft, and maritime migration gave a new character to the wanderings of the primeval

[1] Juvenal, *Sat.* xv.

nomades, as they went abroad upon the face of all the earth. Thenceforth, accordingly, those instinctive tendencies began to characterize certain branches of the human family, as leaders of maritime enterprise, which may be traced under very diverse degrees of social development; as in the Phœnicians, the Northmen, the Malays, and the Polynesians; while other tribes and nations, such as the Celts and Feejeeans, representing, in some respects, opposite extremes of development, though living on the coast, are tempted by no longings to voyage on the ocean's bosom:

The islands of the Central American archipelago were the first to reward the sagacity of Columbus, as he steered his course westward in search of the old East. The arts of their simple natives accordingly first attracted his attention; and although he found among them personal ornaments of gold, sufficient to awaken the avaricious longings of the Spaniards for that fatal treasure of the New World, yet practically they were in total ignorance of all metallurgic arts; and, happy in the luxuriance of an ocean-tempered tropical climate, they knew not the stimulus to ingenious industry which the requisites of clothing call forth in less genial climes. The natives of Guanahanè, or San Salvador, were friendly and gentle savages, in the simplicity, if not in the innocence of nakedness. Their only weapons were lances of wood hardened in the fire, pointed with the teeth or bone of a fish, or furnished with a blade made either of the universal flint, or more frequently with them, from the large tropical shells which abound in the West Indian seas. The native cotton-plant they had learned to turn to economical account, though heedless of the covering garments which modesty and luxury weave out of its useful fibres; but the chief mechanical ingenuity of the islanders was expended on the light barks to which they

gave the now universal name of *canoe*. These were formed from the trunk of a single tree, hollowed by fire, with the help of their primitive adzes of flint or shell; and were of various sizes, from the tiny bark only capable of holding its solitary owner, to the ingenious galley manned by forty or fifty rowers, who propelled it swiftly through the water with their paddles, and baled it with the invaluable native calabash, which supplied to them every domestic utensil, and rendered them altogether indifferent to the potter's art.

The canoe has a peculiar interest and value in relation to the archæology of the New World. To those who still deem the invention of new human species for the peopling of America a gratuitous assumption of science, it is the type of the older caravel of the primeval Columbus who first led the way thither from Asiatic or European shores. The American grey squirrel (*Sciurus migratorius*), it is well known, migrates in prodigious numbers, not only traversing wide tracts of country, but crossing broad rivers, in search of localities where its food abounds. According to oft-repeated popular accounts, it is affirmed, moreover, to embark on such occasions on a rude craft, formed of a stray chip or piece of the bark of a tree, and to cross by its means otherwise impassable lakes of great width. The story, though confidently repeated, requires confirmation; but, assuming its accuracy, had this rudimentary trace of the boat-building instinct developed itself into even the rudest art among inferior animals, the geographical ranges of many species might have been materially changed, since we see that it wanted only the ship which man provided for them, to make the horse, the ox, the sheep, the hog, as naturally at home in the New World as the Old; and, even in defiance of man's will, to carry such pests as the brown rat, the mouse, and also the common house-fly,

almost into every region to which European civilisation has penetrated. To man alone, but by no means exclusively to civilized man, pertains the art of navigating not only rivers, but oceans. With our wondrous steamships, wherewith we have bridged the Atlantic, we are apt to lose faith in the capacity of uncivilized man for overcoming such obstacles as the dividing oceans which had so long concealed the New World from the Old. About the year 1750, a canoe, now preserved in the museum of Marischal College, Aberdeen, was picked up by a ship on the Aberdeen coast, with an Esquimaux in it, still alive, and surrounded by his fishing gear, though the poor voyager died soon after, from being allowed to indulge to excess the voracious appetite which long abstinence had created. This example, though an exceedingly interesting, is not a solitary one; for Humboldt, in his *Views of Nature*, refers to other well-authenticated proofs of natives of America, supposed by him to have probably been Esquimaux from Greenland or Labrador, having been carried by currents from the Western to the Eastern Continent. Again, so recently as 1833, a Japanese junk was wrecked on the coast of Oregon, and some of its crew were subsequently rescued from captivity among the Indians of the Hudson's Bay Territory. Other evidences in proof of the probability of such modes of colonization of the New World will be noticed in a subsequent chapter; but these are sufficient to illustrate the interesting relations between the primitive fleets of the Indian islands first explored by Columbus, and the possible sources of the earliest settlers of America. To Columbus, indeed, with that well-defined faith in the spherical form of the earth which gave him confidence to steer boldly westward in search of the Asiatic Cipango, the Indian canoes suggested no such solution of difficulties of later origin; for the great Admiral died in the

belief that he had reached the eastern shores of the continent of Asia.

Not so, however, was it with the Spanish savans of the fifteenth century, to whose judgment the unaccomplished purpose of Columbus was referred. In the ancient city of Salamanca, there assembled in the Dominican convent of St. Stephen, in the year 1486, a learned and orthodox conclave, summoned by Prior Fernando de Talavera, to investigate the novel theory propounded by Columbus, and to decide whether, in that most Catholic of the kingdoms of Christendom, in which the Inquisition had just been established for the eradication of heresy, it was a permissible belief that the New World of the West existed or no. Columbus, studying the wisdom of a past then drawing to its close, by the clearer light of his later dawn, had already demonstrated the certainty of an ocean highway to the Western Hemisphere. The council of clerical sages included professors of astronomy, geography, mathematics, and other branches of science, as well as learned friars and dignitaries of the Church: perhaps as respectable an assemblage of cloister-bred pedantry and orthodox conservatism as that fifteenth century could produce. Philosophical deductions were parried by a quotation from St. Jerome or St. Augustine, and mathematical demonstrations by a figurative text of Scripture; and in spite alike of the science and the devout religious spirit of Columbus, the orthodox junto of Salamanca divines pronounced the idea of the earth's spherical form heterodox, and a belief in antipodes incompatible with the historical traditions of our faith: since to assert that there were inhabited lands on the opposite side of the globe, would be to maintain that there were nations not descended from Adam, *it being impossible for them to have passed the intervening ocean.* This would be, therefore, to discredit the Bible, which

expressly declares that all men are descended from one common parent.[1]

It may well excite a smile to find the very ethnological problem of the nineteenth century thus dogmatically produced by the sages of Salamanca in the fifteenth century, to prove that America could not exist. But we have not so entirely learned even now to harmonize our scientific belief and our religious faith, that we can afford to sneer at the follies of an age bewildered in the mazes of crude scientific theories and religious controversy. The bark in which Columbus did at length achieve the impossibility of reaching a new world beyond the Atlantic ocean, was in no degree more capable of braving the ocean's terrors than the navies of the Mediterranean were a thousand years before. Nevertheless, it seems to some of our modern scientific theorists an easier thing to create a score of red, brown, and black Adams and Eves, wherewith to increase, multiply, and replenish each "realm," or province of the animal world, than to believe that man was transferred to new regions, and affected by their physical influences, just as we see the horse, ox, and hog have been in our own day. Throughout the Polynesian archipelago, fragments of foreign vocabularies are the chief traces of that oceanic migration by which alone the descendants of a common race could people those distant islands of the sea. The recognition of certain Malay and Polynesian words in the language of the remote island of Madagascar, is one of the striking illustrations of what such intrusive linguistic elements imply. "A navigation of three thousand miles of open sea," says Mr. Crawfurd, "lies between the Indian Islands and Madagascar, and a strong trade-wind prevails in the greater part of it. A voyage from the Indian Islands to Madagascar is possible, even in the rude state of Malayan

[1] *Vide* Irving's *Columbus*, chap. iii.

navigation; but return would be wholly impossible. Commerce, conquest, or colonization are consequently utterly out of the question as means of conveying any portion of the Malayan language to Madagascar. There remains, then, but one way in which this could have taken place: the fortuitous arrival on the shores of Madagascar of tempest-driven Malayan *praus*. . . . The occasional arrival in Madagascar of a shipwrecked *prau* might not indeed be sufficient to account for even the small portion of Malayan found in the Malagasi; but it is offering no violence to the manners or history of the Malay people, to imagine the probability of a piratical fleet, or a fleet carrying one of those migrations of which there are examples on record, being tempest-driven like a single *prau*. Such a fleet, well equipped, well stocked, and well manned, would not only be fit for the long and perilous voyage, but reach Madagascar in a better condition than a fishing or trading boat. It may seem, then, not an improbable supposition, that it was through one or more fortuitous adventures of this description that the language of Madagascar received its influx of Malayan." Dr. Latham, in his *Man and his Migrations*, supplements the remarks of Mr. Crawfurd, by referring to well-authenticated voyages accomplished by escaped slaves from Mauritius. Impelled by the stern necessity of effecting their escape at all hazards from an intolerable bondage, these poor untutored slaves have been known to seize a canoe in the night-time, and with a calabash of water, and a few manioc or cassada roots, endeavour to reach Madagascar, or even Africa, a distance of many hundred miles, without compass or guide, through the pathless and stormy ocean. Many perish in the voyage, but some succeed, and Dr. Latham quotes an instance communicated to him by one who had himself picked up a frail canoe, within about a hundred miles of the coast of

Africa, containing five runaway slaves, who, with only a small quantity of water and rice, and their fishing-lines, had fled from a harsh French master at the Seychelles, and, guided by the stars, were making for the coast from which they had been kidnapped. The poor voyagers had notched on the side of their canoe the record of twenty-one days of weary hope; but one of them then lay dying in the bottom of the canoe, and the others only escaped the same fate by their timely rescue. We see, however, that frailer ships than our ocean steamers may have borne the fathers of nations to remotest isles; and that when that disputed proposition of possible oceanic migration is solved, the objections of St. Augustine and the Salamanca doctors, along with some of those of equally reputable doubters of modern times, to the possible affiliation of the red man and the white, may prove to rest on no better foundations than other obstacles to the belief in a possible new world, which it seemed to the old monkish impugners of science in Salamanca equally reasonable to advance. Copernicus, the astronomical revolutionist, whose solar system was to dethrone this earth from that usurpation of the centre of the universe, which it had held unchallenged since the days of Ptolemy, and to simplify in so many ways the conception of our terrestrial relations in space, was then in his thirteenth year. Yet, in that year, 1486, Columbus was required gravely to refute the objection to his proposed voyage to a transatlantic continent, that, even should a ship succeed in this way in reaching his proposed goal, the extremity of India, she could never get back again; for the rotundity of the globe would present a kind of mountain over which the vessel might indeed under favourable circumstances be carried, as down a rapid, but up which it would be impossible for her to sail with the most favourable wind! To such reasoners the new world of Ame-

rica was clearly enough an absurdity and an impossible thing.

In this view of the case, the canoe of America is the type of a developed instinct pregnant with many suggestive thoughts for us. And the traces of the primeval ship-builder's art accumulate wonderfully so soon as attention is drawn to it: adding fresh evidence of the diffusion of the human race in earliest times to remote outskirts of the ancient world, and of an underlying history not yet embraced within our oldest accredited chroniclings. On the banks of the Scottish Clyde, the modern voyager from the New World looks with peculiar interest on the growing fabrics of those huge steamers, with ribs of steel, and planks, not of oak, but iron, which have made the ocean, that proved so impassable a barrier to the men of the fifteenth century, the easy highway of commerce and pleasure to us. The roar of the iron forge, the clang of the fore-hammer, the intermittent glare of the furnaces, and all the novel appliances of iron ship-building, tell of the modern era of steam; but, meanwhile, underneath these very ship-builders' yards lie the memorials of ancient Clyde fleets in which we are borne back, up the stream of human history, far into prehistoric times. The earliest recorded discovery of a Clyde canoe took place in 1780, at a depth of twenty-five feet below the surface, on a site known by the apt designation of St. Enoch's croft, when digging the foundation of a church dedicated, by a strangely apposite misnomer of the ancient one which occupied the same spot, to the ante-diluvian father of Methuselah. This primitive canoe, hewn out of a single oak, rested in a horizontal position on its keel, and within it, near the prow, there lay a curiously suggestive memorial of the mechanical arts of the remote era to which the ancient ship of the Clyde must be assigned. This was a beautifully finished stone

axe or celt, represented here, doubtless one of the simple implements of the allophylian Caledonian to whom the canoe belonged, if not indeed the tool with which it had been fashioned into shape.

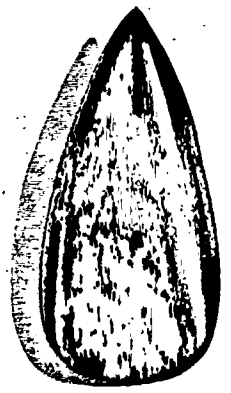


FIG. 2.—Clyde Stone Axe.

Subsequent to this at least sixteen other canoes have been brought to light. None of them are fully equal in interest to the earliest discovery of the stone implement and equally primitive bark; but others have been dug up at greater distances from the modern river's banks, buried in many feet of accumulated soil, underneath sites occupied by the most ancient structures of the city of Glasgow, and doubtless the busy scenes of city life for more than a thousand years. It is difficult to apply any satisfactory chronological test whereby to gauge the lapse of centuries, since this primitive fleet plied in the far-inland estuary that then occupied the modern area through which the Clyde has wrought its later channel; but that the changes in geological, no less than in technological aspects indicate a greatly prolonged interval, cannot admit of doubt; and primitive man, alike in old Africa and in the New World, is still practising the rude ingenuity of the same boat-builder's art, which the allophylian of the Clyde pursued thousands of years ago.

In the interesting narrative of a cruise on the Tanganyika Lake of central Africa, by Captain J. H. Speke, the simple process there pursued in fashioning the native canoe, strikingly illustrates the means by which so imperfect an implement could be turned to account in felling the forest oak, and shaping it into such vessels as that in which the stone axe was found. Writing in his

journal on the 3d March 1858, Captain Speke says:—"All being settled, I set out in a long narrow canoe, hollowed out of the trunk of a single tree. These vessels are mostly built from large timbers, growing in the district of Ugubha, on the western side of the lake. The savages fell them, lop off the branches and ends to the length required, and then, after covering the upper surface with wet mud as the tree lies upon the ground, they set fire to and smoulder out its interior, until nothing but a case remains, which they finish up by paring out with roughly constructed hatchets."

Fire is thus the docile servant of man in all stages of his progress; as needful to the primeval ship-carpenter of the Clyde in constructing his rude oak canoe, as to the modern ocean ship-builder in the completion of his huge iron steam-ship for Atlantic or Australasian voyage. At every stage of human progress we see what subtle meaning there is in the Promethean myth of the Titan son of Iapetus, stealing the fire of Zeus wherewith to endow the infant human race. Prometheus was to the ancient Greek the incarnation of practical intellect, which conquers the elements of nature, and makes them subservient to human necessities; and he was represented as chained by the behest of the supreme Zeus, with bolts forged by Hephæstos the god of metallurgy, in full accordance with the relative progress in man's acquisition of arts and mechanical skill. The fire ascended from the sacrifice of Abel, long generations before it was subdued by Tubal-Cain to the wise ministry of the artificer in brass and iron; and no fitter designation of man, in the descriptive distinctions of scientific classification, could be devised than that of *the fire-using animal.*

The islanders of the Southern Ocean, the natives of many diverse areas of the African continent, and the canoe-builders of the New World, all employ the agency

of fire to supplement their imperfect tools. The stone axe of the St. Enoch's croft canoe is formed of highly polished dark greenstone. It measures five and a half inches in length by three and a half inches in breadth, and an

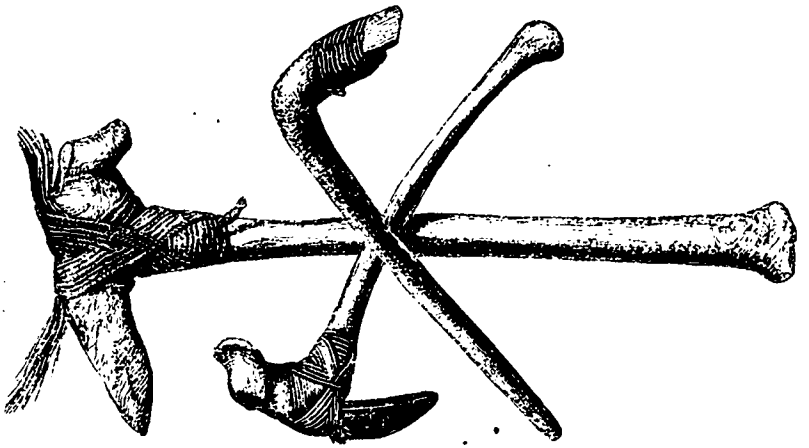


FIG. 3.—South Pacific Stone Implements.

unpolished band round the centre shows where it has been bound to its haft, leaving both ends disengaged, as is frequently the case with the stone hatchets both of the American Indians and the Polynesians. But the accom-

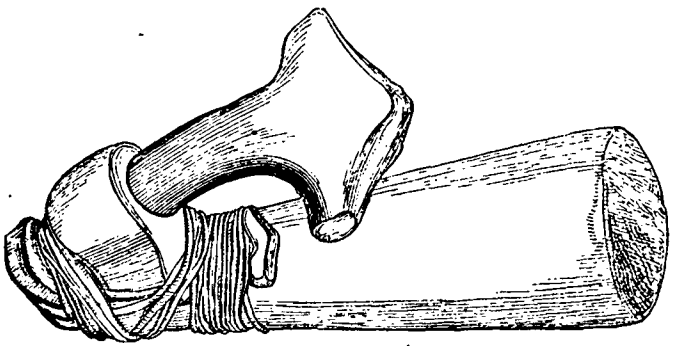


FIG. 4.—Clalam Stone Adze.

panying woodcut shows a much more ingenious mode of hafting the stone adze for hollowing the charred trunk, and shaping it into a canoe. It is drawn from one brought by Mr. Paul Kane from the Pacific coast, where

such implements are in use by the Clalam Indians, who occupy the shores of Puget's Sound and the Straits of De Fuca, and construct, out of the hollowed trunks of single trees, large and highly ornamented canoes, in which they fearlessly face the dangers of the Pacific ocean.

The lower reaches of the Columbia river, for nearly forty miles before it enters the Pacific, constitute, strictly speaking, an estuary of the sea, indented by bays, and varying in breadth from three to seven miles. There, at Cape Flattery, and along the neighbouring coasts, the various tribes live to a great extent on the spoils of the sea. In the lower part of the Columbia river, a small fish, called by the natives Uhlékun, is caught in immense numbers, and is greatly prized on account of its oily fatness, which is such that when dried it will burn with a clear steady light like a candle. The Uhlékuns are caught with astonishing rapidity by means of an instrument about seven feet long, the curved wooden blade of which, measuring about four feet, is somewhat the shape of a sabre. Along the convex edge, at distances of an inch and a half, are inserted sharp bone-teeth about an inch long. The Indian standing in the canoe draws this edgeways with both hands rapidly through the dense shoals of fish, which are so thick that almost every tooth will strike a fish. One knock across the thwarts safely deposits them in the bottom of the canoe; and this is done with such rapidity that nets are considered useless. But the skill which the fishing tribes of the North Pacific coasts show in the management of their canoes finds a better field for its display than the easy capture of the Uhlékun in the estuary of the Columbia river. Some of their canoes, made out of a single tree, measure upwards of fifty feet long, and are capable of carrying thirty as a crew. They have thwarts from side to side, about three inches thick, and their gunwales curve outwards so as to

throw off the waves. The bow and stern rise in a graceful sweep sometimes to a height of five feet, and are decorated with grotesque figures of men and animals. In managing these canoes, the Indian crew kneel two and two along the bottom, and propel them rapidly with paddles from four to five feet long, wielded with the two hands, without touching the side of the canoe, while a bowman and steersman sit each with his paddle at either end. Washington Irving, in describing the Oregon Indians, remarks: "It is surprising to see with what fearless unconcern these savages venture in their light barks upon the roughest and most tempestuous seas. They seem to ride upon the wave like sea-fowl. Should a surge throw the canoe upon its side, and endanger its overturn, those to windward lean over the upper gunwale, thrust their paddles deep into the wave, and by this action not merely regain an equilibrium, but give their bark a vigorous impulse forward."

To such fearless navigators the violent currents of the Straits of De Fuca, or the stormy waves of the Pacific, present little to daunt them; and one of their most coveted, though now rarely attained, prizes is the whale. Since the encroachments of European settlements on their territories their game has greatly diminished, and few whales approach the coast; but, when an opportunity offers, the Indians are enthusiastic in the chase, and the process by which they secure their prize furnishes an interesting illustration of native ingenuity and daring. Upon a whale being seen blowing in the offing, they rush down to their large canoes and push off, furnished with a number of large, strong seal-skin bags filled with air. To each bag a barbed spear-head is attached by a cord about nine feet long, and in the socket of the spear-head is fitted a handle five or six feet in length. Upon coming up with the whale, the barbed heads, with the

air-bags attached, are driven into it, and the handles withdrawn. The attack is continually renewed in this manner, until the whale is no longer able to sink from the buoyancy of the bags, when he is despatched and towed ashore. The blubber of the whale is as much prized amongst the Indians of the Straits of De Fuca as by the Esquimaux. It is cut into stripes about two feet long and four inches wide, and eaten generally with their dried fish.

Thus we see, from the illustrations supplied by the maritime skill and enterprise of modern tribes, to how much greater extent the ancient canoe may have sufficed for oceanic expeditions than our familiarity with the elaborately perfected modern craft inclines us to believe possible. The old navigators of the estuary of the Clyde were probably not a whit less fearless than the native whalers of the Oregon coast; and they had to face dangers fully equal to any of those to which the voyagers of the Pacific are exposed, whenever they navigated the lochs and island channels towards its mouth, or ventured beyond it, to face the gales and currents of the Irish Sea. The ancient alluvium of the river Clyde has supplied an unusually rich store of illustrations of primitive ship carpentry; but the disclosures of another Scottish locality also merit notice here. The carse, or alluvial plain of Falkirk, like that of Stirling, is intimately associated with some very memorable events of Scottish history. It is traversed by the vallum and chain of forts reared by Lollius Urbicus, the Roman proprætor of Antoninus Pius in the early part of the second century, and is rich in memorials of later incidents already referred to. But underneath the ancient footprints of Scottish patriot and invader lie records of older human history. According to the Statistical Accounts, in the vicinity of Falkirk an

ancient boat was discovered some thirty feet below the surface of the same carse from which the remains of a fossil elephant were exhumed in excavating the Union Canal in 1821. In the earlier part of the previous century a sudden rise of the river Carron undermined a portion of its banks, and exposed to view an ancient canoe of unusually large dimensions, lying imbedded in the alluvial soil at a depth of fifteen feet, and covered by successive strata of clay, shells, moss, sand, and gravel. Sir John Clerk has described it with great minuteness in the *Bibliotheca Topographica Britannica* as an antediluvian boat; and in an extract from a contemporary newspaper it is stated to have been finely polished and perfectly smooth, both inside and outside, and formed from a single oak-tree, with pointed stem and square stern. These traces of primitive human art have already been referred to in the *Prehistoric Annals of Scotland*, but a further discovery in the same locality confers a fresh interest upon them. Soon after the publication of that work, when on a visit to Falkirk,

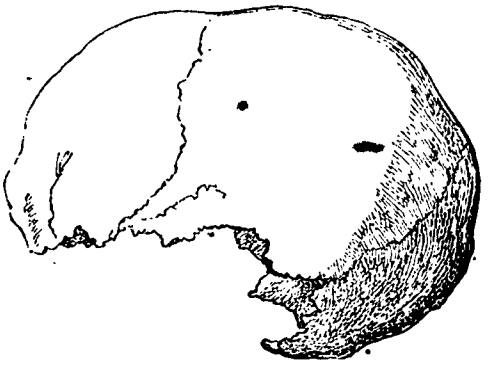


FIG. 5.—Grangemouth Skull.

I was shown by Dr. G. Hamilton a human skull, which at once attracted my attention from its marked correspondence to the brachycephalic crania of ancient British graves. It is figured here, from a drawing executed with great care at a later date, from which it will be

seen that the skull is imperfect in the base, and the facial bones are wanting. It is well developed, according to the type of crania of the early Scottish tumuli. But what confers the special interest on this imperfect human skull is, that it was found in the same alluvial carse-land as the ancient canoes, and the fossil bones of the *Elephas primigenius*, twenty feet below the surface, in a bed of shell and gravel, when digging the area of the large Grangemouth lock of the Union Canal, on the 29th of June 1843.[1] Thus, while in one case we recover traces of the ancient tools of the prehistoric ship-carpenter, in another we seem to alight on evidences of his own physical characteristics, corresponding in all respects with those which have already been recognised as appertaining to the allophylian of the Scottish stone-period.

The bee, according to Huber, when interrupted in its cell-building operations, adapted its structure to the novel circumstances imposed on it, altering the otherwise invariable hexagon. The bird, in like manner, accommodates the form of its nest to the peculiarities of the chosen locality; as if making the instinctive process subservient to the rational. We need not wonder therefore to find the primitive arts of man, while disclosing a correspondence in many respects so remarkable, yet also revealing constant traces of such adaptation as pertains to his higher attributes of reason and experience. Among many of the islands of the Southern Ocean, the boats are simple wooden canoes, pointed at either end, and propelled through the water with the paddle; but the barks of the true Polynesians are more elaborate and ingenious.

[1] The discovery attracted considerable attention at the time, and was minutely described in some current periodical—*Chambers's Journal* was named to me, but no notice is to be found in its pages; and Mr. Robert Chambers has kindly searched other sources for me without being able to recover the clue. The label, however, attached to the skull records the above facts and date, and is authenticated with the signature "Thomas Wilson."

Frequently they are double, with a raised platform or quarter-deck, and they are invariably provided with an outrigger, an article seemingly of Malay origin. So essential, indeed, is the latter deemed for the safe navigation of their ocean archipelago, that the most remarkable characteristic recognised by the Tahitians, when Captain Cook's vessels first revealed to them the wonders of European civilisation, was the want of the indispensable outrigger. Throughout the mythology of oceanic Polynesia, Mawai, the upholder of the earth, and the revealer of the secrets of the future, plays a prominent part. In one of his prophecies, Mawai foretold that a canoe such as had never been seen before, a canoe without outriggers, should in process of time come out of the ocean. But to the mind of the Tahitian, an ocean canoe without outriggers was so impossible a thing that they laughed their prophet to scorn; whereupon Mawai launched his wooden dish on the waters, which swam without outriggers, and the Tahitians thenceforward looked for the strange-marvel of the outriggerless canoe. Accordingly when Cook visited the islands, his ship was regarded as the fulfilment of the prophecy, and still English vessels are frequently called Mawai's Canoes. The mythic prophecy seems in reality one of those vague traditions of ancestral intercourse with other members of the human family, such as, among the Aztecs, led to the belief that the ships of Cortes had returned from the source of the rising sun, with Quetzalcoatl, the divine instructor of their forefathers in the arts of civilisation.

The *proa* of the Pacific is a product of the naval architecture and maritime skill for which the Malays are specially distinguished among the islanders of its archipelagos. It is generally formed of two pieces of wood joined lengthways, and sewed together with bark; and is found chiefly within the region of the trade-winds,

for which it is peculiarly adapted. The indispensable outrigger, the absence of which constituted, to the Tahitians, the grand marvel of Captain Cook's ship, is a contrivance for counterbalancing the large sails of the Malay proa, and the piroque or monoxylous canoe of the Pacific. In its most common form, it consists of two spars fastened athwart the vessel, and projecting about half its length to windward. The ends of the spars are attached to a heavy beam, sometimes in the shape of a small canoe; and to mariners familiar only with the light proa, the idea of a vessel carrying large sails on the open sea without an outrigger, must seem a miracle requiring Mawai's aid. The outrigger is also used in some of the small narrow canoes of the Pacific; and propelled by a rude sail of matting, or sometimes only by the paddle, and protected by this contrivance against the danger of upsetting, the fearless ocean voyagers find their way from island to island, through the most tempestuous seas. We are, in truth, in danger of forgetting, amid the luxuriant appliances of our ocean steamships, how moderate are the means which, in this, as in other requirements of man, suffice to supply all the necessities of his being.

The population of the great Polynesian archipelago presents many highly interesting and suggestive features, bearing closely on the question of oceanic migration. The area of Polynesia proper is defined by Latham to extend from the small islands westward of the Pellews to Easter Island, and from the Mariannes and the Sandwich Islands to New Zealand on the south. The means of acquiring animal food in nearly all the islands is almost exclusively limited to the sea. The cocoa-nut, the taro, the banana, and other vegetable food, constitute their chief diet; and hence, possibly, one source of the tendency to cannibalism so horribly developed among

some of the island group. In Tonga-tabú and Easter Island, as well as in the Micronesian Rota, Tinian, Ualan, and throughout the Caroline group, remains of massive stone-buildings, the origin or use of which is wholly unknown to the natives, reveal traces of an extinct civilisation; and also afford some possible clue to the strange ethnological phenomena of the Oceanic Archipelago. Professor Dana, who, as geologist to the United States' Exploring Expedition, had such abundant opportunities for observation, came to the conclusion that an immense area in the Pacific has for ages been gradually subsiding, and that the numerous Lagoon Islands mark the spots where what were once the highest peaks of mountains have finally been submerged. Mr. Hale, the philologist of the same expedition, gathered sufficient data from a European who had been resident for a time on the island of Bonabe, in the Caroline archipelago, and from his own observations, to satisfy him that the remarkable stone structures, both Ualan and Bonabe, were erected when the sites on which they stand were at a different level from that they now occupy. "At present they are actually in the water; what were once paths, are now passages for canoes, and when the walls are broken down the water enters the enclosure."

Such an idea seems like a glimpse of far-reaching truths relative to the unwritten history of the mysterious past in that recently explored Southern Ocean. When Columbus discovered the islands of the New World, he found them lying in thickly-clustered groups, and ere long reached the mainland of a great continent, which lay in close vicinity to its island satellites. But it was altogether different with the Columbus of the Southern Ocean. A strange Antarctic as well as an Australian continent lay there also, awaiting new discoverers; but far beyond their coasts the Pacific and Southern groups

dotted the wide expanse of ocean, like the stars that lose themselves in the deep abysses of night. We read with wonder, as strange as that which rewarded the revelations of the Western Ocean in the closing years of the fifteenth century, of the voyages and discoveries of Byron, Wallis, Carteret, and of Cook and later explorers of the South Pacific Ocean. When Captain Cook reached the Cape on his return from his second expedition, in 1774, he had sailed no less than twenty thousand leagues, through unknown seas, since he left the same point twenty months before. His grand quest was in search of the unknown *Terra Australis Incognita*, a continent which it was assumed must exist in the Southern Ocean, as a counterpoise to the land occupying so large a portion of the northern hemisphere; but instead of this, the voyagers sailed for days and weeks through a vast ocean, arriving by chance, now and again, at some little island, cut off from all the world besides, yet tenanted by human beings. And, as later voyagers have noted, on sailing once more into the limitless horizon, after another long interval, in which many hundreds of miles have been passed, another island speck appears; and not only is it also inhabited, but affinities of speech, mythology, and the primitive ingenuity of native arts, all concur in proving a community of origin. To account satisfactorily for so puzzling a problem of ethnology has taxed the ingenuity and skill of some of our ablest elucidators of the history of man. The botanist was long in doubt as to the laws which regulate the distribution of plants over the globe, and was called on at once to explain the occurrence of a peculiar flora in islands like those of the Pacific, cut off from the rest of the world by a vast expanse of ocean; and again, to reconcile the fact of the same or allied species being diffused over areas separated from each

other by the same, or other barriers equally impassable. But Professor Edward Forbes and Dr. Hooker have effectually cleared up the difficulties which the botanist experienced; and a similar mode of dealing with those of the ethnologist seems to have passed through the mind of Darwin, as he explored the peopled islands of the Southern Pacific, whatever changes may have since modified his views. Other subjects engaged his attention, and fill the interesting pages of his *Voyage of a Naturalist*, and it is only as a passing thought that he observes: "Nor can I quite pass over the probability of the former existence of large archipelagos of lofty islands, where now only rings of coral rock scarcely break the open expanse of the sea, throwing some light on the distribution of the inhabitants of the other high islands now left standing, so immensely remote from each other, in the midst of the great ocean."

Time is the element most frequently required in the hypotheses of the ethnologist. The geologist, happily freed from the trammels of diluvial systems, takes to himself unlimited ages for the working out of the phenomena revealed to him in the earth's crust; and, with the command of requisite time, the whole cosmical history moves onward in calm, majestic progression, under the operation of laws of nature little differing from those still in force. The palæontologist and the botanist, guided by the same laws, see many mysteries disappear; but the ethnologist is restricted from such license by historical evidence, which he may critically elucidate, but which he dare not ignore. The very license, however, which the geologist has thus acquired at so critical a time for his science, probably tempts him to its abuse; and the ethnologist is apt to stumble at assumed intervals of vast extent in time demanded by the geologist, in relation to those most recent phenomena in

which he is chiefly interested. In this respect it will probably be found that, in many of those post-tertiary formations now being associated with the traces of man and his arts, a greater antiquity has been demanded by the geologist than is indispensable to account for their deposition. And so also may it be with the theory of submergence of a southern continent, or great archipelago of thickly-clustering and lofty islands. That the coral reefs and atolls of the Southern Pacific prove that an immense area in that ocean has for ages been slowly sinking beneath its waves, until large portions have been submerged and have disappeared, is an opinion universally admitted by geologists. Dana assigns such changes to a period "probably within and since the tertiary epoch;" and the facts noted in reference to the ruined structures at Bonabe prove that they were prolonged into modern times, coeval with human history. If such a process of subsidation were still in progress, many of the low coral islands of the Pacific would disappear beneath the ocean in the lapse of comparatively few centuries; and by such natural causes, continuous island chains may have been engulfed, which once formed the natural resting-places, by means of which the fleets of Polynesia piloted their way to islands now separated by seemingly impassable ocean barriers, and even found their way to Southern America.

We must not, however, be misled here, any more than in our estimate of possible Atlantic voyagers, by the undue contempt with which the European is apt to gauge the capacity of such island mariners in their native craft. At Vanikoro, the native canoe is a mere rudely-fashioned trunk of a tree, sufficiently grooved to afford foot-hold; yet to this the islander attaches an outrigger, spreads a mat for his sail, and boldly launches forth into the ocean, though probably few Europeans

would be induced to venture in such a craft on the stillest pool. Dr. Pickering, when illustrating the ideas of oceanic migration which he was led to form from intimate observations of widely-scattered and very diverse branches of the human family, remarks: "Of the aboriginal vessels of the Pacific, two kinds only are adapted for long sea-voyages: those of Japan, and the large double canoes of the Society and Tonga groups. In times anterior to the impulse given to civilized Europe, through the noble enterprise of Columbus, Polynesians were accustomed to undertake sea-voyages nearly as long, exposed to equal dangers, and in vessels of far inferior construction. However incredible this may appear to many, there is sufficient evidence of the fact. The Tonga people are known to hold intercourse with Vavao, Samoa, the Feejee Islands, Rotuma, and the New Hebrides. But there is a document, published before those seas were frequented by whalers and trading-vessels, which shows a more extensive aboriginal acquaintance with the islands of the Pacific. I allude to the map obtained by Forster and Cook from a native of the Society Islands, and which has been shown to contain not only the Marquesas, and the islands south and east of Tahiti, but the Samoan, Feejee, and even more distant groups. Again, in regard to the principles of navigation, the Polynesians appear to possess a better knowledge of the subject than is commonly supposed, as is shown from recent discoveries at the Hawaiian Islands. One of the Hawaiian headlands has been found to bear the name of *The starting-place for Tahiti;* the canoes, according to the account of the natives, derived through the missionaries, leaving in former times at a certain season of the year, and directing their course by a particular star." Thus we perceive, notwithstanding the silence of history, oceanic

migration presented no insurmountable obstacle to the fearless and migratory Polynesian, with his naturally wandering disposition, and his aptitude for maritime enterprise. Hence the marvel, that each little coral and volcanic island, widely scattered through the vast ocean that spreads its expanse of waters between Asia and America, is found with its human occupants, its aboriginal arts, and its little fleet of ocean-canoes.

But leaving such glimpses of oceanic migration, there is another aspect in which the ingenuity of the primitive boat-builder of the New World is exhibited, which is highly characteristic in itself, and also worthy of a passing notice from some elements of comparison it affords with the primeval ingenuity of the ancient world. Throughout the islands of the American archipelago, and among the southern tribes, where large and freely navigable rivers abound, the native canoe was made of various sizes, but invariably of the trunk of a tree hollowed out, and reduced to the required shape. Such appears to be the universal instinctive type of the primitive mariner's craft; but where obstacles interfere with its accomplishment, the rudest races devise means to obviate the difficulty. Among the Australians, seemingly the most hopelessly degraded of all the human family, the native timber is mostly too heavy to float in water, and the Australian constructs for himself a bark canoe, sufficient for bearing him over a smooth stream, though not such as to tempt him to face the violence of the open sea. Again, the Californian canoe is a mere rude float made of rushes, in the form of a lashed-up hammock; while at the opposite end of the scale of such untutored ship-craft, the canoes of the Navigator Islands, in the Pacific,—so called by La Perouse, their first discoverer, owing to the graceful shape and superior workmanship of these vessels,—are formed

of irregular pieces of wood, sewed together by means of a raised interior margin. In this the skilful carpenter is guided by taste or utility, and not by necessity, for the Navigator Islands are fertile and populous, and clothed to the summits of their lofty hills with luxuriant forests and richly-laden fruit-trees.

But across the wide area of the northern continent of America, which stretches from the Gulf of the St. Lawrence to the Pacific, a totally different combination of physical circumstances has given bent to the developments of Indian ingenuity in the art of boat-building. In the St. Lawrence itself, and throughout all its principal tributaries, navigation is constantly impeded by waterfalls or rapids, which constitute an insurmountable barrier to ordinary navigation. In like manner the whole country along the northern and southern shores of Lake Ontario, the valley of the Ottawa, reaching towards Georgian Bay and Lake Superior, and much of the route between that and the Rocky Mountains, is a chain of lakes or interrupted river navigation. Hence all the principal routes of travel consist of lines of lake and river united by "portages," or carrying-places, over which the canoe and all its contents have to be borne by the native boatmen, or the voyageurs, as the French Canadians and half-breeds of the traders and Hudson's Bay Company are called. For such mode of transport the wooden canoe would be all but impracticable, and accordingly, probably long ages before voyageurs of European descent had learned to handle such canoes, the native Indian devised for himself his light and graceful bark-boat, made from the rind of the *Betula papyracea*, or canoe-birch. This species of American birch grows in great abundance, where the soil is good often acquiring a height of seventy feet. The wood is of little value, as it soon decays on exposure, but its

tough and durable bark is invaluable to the American Indian, and scarcely less indispensable to his European supplanter. The birch-bark wigwam is the common residence of most of the tribes from the Atlantic coast till the region frequented by the buffalo is approached, and its skins supply a superior substitute. But the most important use of the bark is as the principal material of the portable canoe. The skeleton is formed by constructing a frame, called by the French Canadians *gabarie*, which represents the rim of the intended canoe, and its form is completed in skeleton by a series of light ribs of cedar-wood, covered with a sheathing of thin, flexible slips of the same placed longitudinally. Over this the covering of birch-bark is laid, generally rising into a gracefully curved stem and stern; and the whole sheathing is sewed together, and to the cedar-frame, by means of an awl of pointed bone, with thread composed of the fibrous roots of the cedar, or of the white spruce, soaked in boiling water. The seams are then caulked with the prepared resin of the Balm of Gilead fir, or the pitch-pine; and not unfrequently the whole receives an artistic finish by being decorated with figures of animals, or other Indian pictorial devices. The voyagers in such canoes kneel in the bottom, and propel them by a light paddle; it being indispensable for safety in such slight fabrics to keep the centre of gravity as low as possible. They are made of all sizes, from the small hunting-canoe of twelve feet long, and weighing only twenty pounds, to the *canot de maître*, or large north-western canoe of the fur trade, which measures thirty-six feet, and is propelled by fourteen rowers. On the Canadian rivers, and in the Hudson's Bay territory, the voyageurs beguile the labour of the paddle with simple monotonous songs, of which one takes up the air and the whole join in chorus; and, while the novelty

of the scene and circumstances relieves the uniformity of an endless range of wooded river or lake scenery, few modes of transport can surpass the swift, noiseless gliding of the birch-bark canoe, or the hilarious excitement of the voyageurs and half-breeds, when a rapid of manageable force has to be surmounted by increased vehemence in plying the paddle, and the cheering stimulus of the noisy chorus.

The portage and portable canoe were not unknown to the ancient allophylian of the British Isles, though, with little necessity for the frequent or general use of such, less skill was applied to the construction of a suitable vessel. In Mr. E. P. Shirley's *Account of the Dominion of Farney in Ulster*, a curious and interesting example of such a portable boat is figured and described, which was found in a bog in that territory of Ulster. It is formed of the trunk of an oak-tree, measuring twelve feet in length by three feet in breadth, and is hollowed out, and furnished with handles at both ends, evidently for facility of transport from one loch to another, in a district where, like many in Canada, numerous small lakes cover the surface, such as among the ancient Irish chiefs frequently formed chosen retreats, where they constructed their insulated strongholds beyond the reach of hostile surprise.

A much closer analogy might be traced between the Indian birch-bark canoe and the coracle of the ancient Briton described by Julius Cæsar, which was made of wicker-work covered with skins. Such, however, are rather to be regarded as the ancient British counterpart of the Esquimaux canoe, which, like it, is formed of a light frame covered with skin; and as this is brought over the top, and made to wrap round the body of its solitary occupant, it enables the amphibious navigator, both of the North Pacific and Greenland seas,

to brave a stormy ocean in which no open boat could live.

Hamilco, the Carthaginian, according to Festus Avienus, witnessed the ancient Britons "ploughing the ocean in a novel boat; for, strange to tell, they constructed their vessels with skins joined together, and often navigated the sea in a hide of leather." Upwards of four centuries later, Cæsar found the same stormy sea navigated by the southern Britons in coracles made of a hide stretched over a light timber and osier frame. When, in the sixth century, we once more recover, in the lives of the Irish Saints, some glimpse of maritime arts, it is in the same coracles,—sometimes made of a single hide, and in other cases, such as the ocean currach of St. Columba, of several skins sewed together,—that the evangelists of Iona crossed the Irish sea, visited the Orkney and Shetland Islands, and even, as there is reason to believe, preceded the Northmen in the discovery of Iceland. The old Scottish historian Bellenden, writing in the sixteenth century, asks: "How can there be greater ingyne than to make a boat of a bull's hyde bound with nothing but wands? This boat is called a currock, with which they fish, and sometimes pass over great rivers." Yet this singularly primitive boat is still to be met with in the river-estuaries of Wales, and on various parts of the Irish coast; the counterpart of the Esquimaux *baydar* or skin-canoe, with which the Aleutian Islanders navigate the intervening ocean between Asia and America. Dr. Pickering remarks, on encountering it to the north of the Straits of De Fuca:—"From its lightness, elegance, and the capacity of being rendered impervious to both air and water, I could not but admire its perfect adaptation to the purposes of navigation; for it seemed almost to enable man to take a place among the proper inhabitants of the deep. Such vessels are

obviously fitted to cope with the open sea, and, so far as the absence of sails permits, to traverse a considerable expanse of ocean."

The same intelligent explorer sums up the results of his opportunities of observation on types, as he believes, of all the most diverse varieties of mankind, by affirming: "I have seen, in all, eleven races of men, and though I am hardly prepared to fix a positive limit to their number, I confess, after having visited so many different parts of the globe, that I am at a loss where to look for others." Nevertheless, he unhesitatingly pronounces the aboriginal Americans,—alike as indicated in the sculptures of Mexico and Yucatan, the carvings of the ancient mounds of Ohio, and the portraits and living features of many existing tribes,—of the Mongolian race, and therefore of Asiatic origin; and in speaking of the ingenious *baydar* of the Aleutian Islands, he adds: "The presence of these skin-canoes among the Esquimaux of the Greenland Seas, was long regarded as a proof of the existence of a north-west passage; and it likewise indicates the course of human migrations. I have not examined authorities to ascertain whether the passage across Behring Straits is practicable for a people in the purely hunter state. But in view of the large portion of North-west America in contact with maritime tribes, these tribes have appeared to me the most probable source of the inland population." Dr. Pickering does not, however, limit his ideas of Asiatic migration to this single northern source; but, on the contrary, states as the result of his peculiarly favourable opportunities for observation, his reasons for believing in various entirely independent routes of oceanic migration to the New World. This question is discussed in a subsequent chapter, but the opinion is one which must carry all the more weight as coming from one who so entirely dis-

cards the idea of a common Adamic or Noachic origin for man.

Indispensable as the means of oceanic migration are to every theory of American colonization, excepting that which ranks the Red Man among the indigenous fauna of the New World, the peculiar characteristics of its tiny fleets are full of interest for us, and none more so than the baydar of the Pacific Esquimaux. The same ingenious vessel reappears, under the name of the *kaiak*, in the Greenland Seas; and in just such a fragile bark, the poor Greenlander had crossed the wide, stormy ocean, when rescued off the Scottish coast, only to perish on the long looked-for shore. In such a bark, therefore, the passage from the Asiatic to the American shores is no impossible feat; as, indeed, it is probable that the bark of the primeval Columbus, who led the way from the continent of Europe to the untrodden wilds of Britain, bore a close resemblance to it.

It is a curious fact, well worthy of notice, that throughout the American continent, seemingly so dependent on maritime colonization for its settlement by man, the use of sails as a means of propelling vessels through the water appears to have been almost unknown; and, indeed, so far as North America is specially considered, was entirely unknown to the native Indians. Prescott, when describing the singular suspension bridges, made of the tough fibres of the maguey, with which the Peruvians spanned the broad gullies of their mountain streams, adds: "The wider and more tranquil waters were crossed on *balsas*, a kind of raft still much used by the natives, to which sails were attached, furnishing the only instance of this higher kind of navigation among the American Indians."[1] This description of the historian, however, is apt to convey a false impression; for, although the Peru-

[1] *Conquest of Peru*, vol. i. b. 1, ch. 2.

vians were so essentially an agricultural and unmaritime people, nevertheless the use of sails in their coasting trade, constitutes one of their noticeable points of superiority over all the other nations of the New World. Attention is specially directed to this by an incident recorded in the second expedition for the discovery of Peru preparatory to its conquest. Bartholomew Ruiz, the pilot of the expedition, after lingering on the coast, near the Bay of St. Matthew, stood out into the wide ocean, when he was suddenly surprised by the sight of a vessel in that strange, silent sea, seemingly, in the distance, like a caravel of considerable size, with its broad sail spread before the wind. "The old navigator was not a little perplexed by this phenomenon, as he was confident that no European bark could have been before him in these latitudes, and no Indian nation yet discovered, not even the civilized Mexican, was acquainted with the use of sails in navigation." As he drew near he found it a large native *balsa*, formed of huge timbers of light, porous wood, and with a flooring of reeds raised above them. Two masts sustained the large, square, cotton sail, and a movable keel and rudder enabled the boatmen to steer. This vessel plays a more important part in the history of the discovery and conquest of Peru, than the galley, or great canoe of the Indian cacique does in that of Mexico. Seen by Columbus on his fourth voyage, off the coast of Honduras, that canoe seemed to beckon him, though in vain, to the shores of Yucatan, the discovery of Mexico, and all the triumphs reaped by Cortes at a later day. It was otherwise with the Peruvian balsa. On board of it Ruiz found ornaments displaying great skill, wrought in silver and gold, vases and mirrors of burnished silver, curious fabrics, both cotton and woollen, and a pair of balances made to weigh the precious metals. Here were the first undoubted evidences

of the existence of that strange seat of a native American civilisation, among the lofty valleys of the Southern Andes, which he was in search of. The balsa's crew included both men and women, who carried with them provisions for their voyage, and had come from a Peruvian port some degrees to the south. Like older voyagers of the Mediterranean, the Peruvian pilots were wont to creep timidly along the shore; but the Spaniards encountered them in the open Pacific, where no European prow had ever sailed. Caught by a sudden gale their bark might have been borne far off among the islands that stud the Southern Ocean, and here was the germ of a race of islanders, to whom, after a few generations, the memory of their Peruvian ancestry would have survived only as some mythic legend, like the Manco Capac of their own Incas, or the Mawai of the Polynesian archipelago.

CHAPTER VII.

THE TECHNOLOGICAL INSTINCT: TOOLS.

THE earliest character in which God reveals himself to man is as the Supreme Artificer. In the beginning God created the heavens and the earth; and, as the increasing powers of the telescope help us to penetrate ever deeper into the dark recesses of space, and the progress of the microscope discloses minuter traces of that invisible world of order and infinite beauty which lies within the meanest objects that surround us on every hand, we only learn to dwell with profounder wonder and admiration on the perfect art with which creation is inwrought. And, in like manner, at the beginning of a new order of life, God, who is himself so wondrous an artificer, created man in his own image, with instincts and faculties for art, commanding a range compared with which the tool-born ant, and spider, and bee seem but as ingenious self-acting machines, each made to execute perfectly its one little item in the comprehensive plan of creation.

As industrial artificers, the creatures so far beneath us in the scale of organization seem often to put to shame our most perfect workmanship; yet, provided with no other instruments than the eye and the hand, but guided by that intelligent reason which distinguishes man from the brutes, we see him, even as an artificer, presenting characteristics of the Divine image, which are altogether wanting in the lower animals. Labour is for them no

sternly imposed necessity, but an inevitable process, having only one possible form of manifestation; producing in its exercise the highest enjoyment the labourer is capable of; and in its results leading our thoughts from the wise, unerring, yet untaught worker, to Him whose work it is, and of whose wisdom and skill the workmanship, not less than the workman, appears a direct manifestation. It is not so with man. As the wise preacher has told, God made him upright, but he has sought out many inventions. The capacity of the workman is a divine gift, but the work is his own, and too often betrays, in some of its most ingenious devices and results, anything rather than a divine origin.

As Bacon teaches, and as Plato had taught before Bacon, the mind brings to every action an antecedent idea; and so it was after the Creator had seen that all else, animate and inanimate, was good, that he said: "Let us make man in our image, after our likeness;" and the Divine idea went onward to its realization. Our planet had been the theatre of life in infinite variety for countless ages; the once vital structures and minutest microscopic organisms of that ancient past had been built up into carboniferous, silicious, and cretaceous strata, and mighty cycles of animal life had fulfilled their allotted destinies, and been embalmed and entombed in the living rock; but, for the first time, the earth was to have for its occupant a being capable of intelligent progression. If we conceive of some superior intelligence seeking hereafter to arrive at an adequate knowledge of man, as the higher animal, and of his relative rank in the scale of animal life, by means of his fossil remains: remarkable as are the differences which his osteological relics present, when compared with those of any other of the vertebrata, a singularly imperfect conception would be formed of what place man had actually filled in the economy of

life. But for such an observer other than the mere osteological traces of man are in store. The strange armaments of Eastern enterprise; the commercial navies of the Jasons, the Hirams, and the Ptolemies of old; the viking galleys of the Northmen; the caravels of the Mediterranean; the war galleys and merchant ships of Sidon and Carthage, of Gadir, Massala, Pisa, and Venice; the royal argosies and proud armadas of Spain; the lone Arctic explorers and the stately fleets of England; oaken three-deckers, richly freighted East-Indiamen, and wondrously constructed ocean steam-ships; with gold, and gems, and strangely varied stores, have all gone down into the ocean's depths.

What a treasury of art and history is already imbedded in the basin of the Mediterranean! Along the tracks of commerce in the pathless ocean what marvellous formations are being treasured in the strata that shall rise to form new continents, when perchance the submerged coral reefs of the Pacific shall be the summits of lofty mountains, in the long-sought *Terra Australis Incognita*, known and found at last. Stabiae, Herculaneum, and Pompeii, show what earthquakes and volcanos may effect. The cliff of Guadaloupe, with its fossil skeletons, pottery, stone arrow-heads, and even carved wooden relics, all petrified into limestone rock, reveals the results of one of the ordinary processes by which the detritus of shells and corals, with the consolidated sand, solidifies into stone. If ours be not the latest stage of being, but is to be succeeded by "new heavens and a new earth," marvellous indeed are the revelations which those posthistoric strata have yet to disclose. But even they will scarcely suffice to reveal the most striking characteristics of a being for the first time introduced into that long chain of organic life, on whom the external economy of nature reacts in a way it never did on living

being before; while he is capable of releasing himself altogether from the domination of such external elements of sensation; of searching into the past; anticipating the future; of looking inward, and being a law unto himself. His nature embraces possibilities of the widest conceivable diversity, for his is no longer the law of instinct but of reason: law, therefore, that brings with it conscious liberty, and also conscious responsibility. If our present mode of viewing him admitted of the full consideration of all that is implied in the probation of a being endowed, as we are assured alike by nature and revelation, with not only life but immortality, a consideration of the moral constitution of this the latest of the creations of God, would involve very lofty themes; but while we cannot, even from the ethnologist's point of view, regard man solely as the zoological *Bimana*, and treat him like the mere zoologist, "who shows a Newton as he shows an ape," we must limit our present view to the influences of his moral and intellectual nature in their artistic manifestations.

But an important and seemingly conflicting element arises out of the capacity of man for moral progression, to which some ethnologists fail to give due weight. A suggestive thought of Agassiz, relative to certain real or supposed analogies between the geographical distribution of species of simiæ, and especially the anthropoid monkeys, and certain inferior types of man, sufficed as the nucleus of Gliddon's elaborate monkey-chart in the *Indigenous Races of the Earth*, illustrative of the geographical distribution of monkeys in the relation to that of certain types of men. Notwithstanding the very monkey-fying process to which some of the illustrations of inferior human types have been subjected in this pictorial chorography, the correspondences are not such as to carry conviction to most minds. But, assuming, for the sake

of argument, or as a supposed *reductio ad absurdum*, the descent of all the diverse species of monkeys from a single pair, Mr. Gliddon thus sums up his final observations: "I propose, therefore, that a male and female pair of the 'species' *Cynocephalus Hamadryas*, be henceforward recognised as the anthropoid analogues of Noah, Shem, Ham, and Japhet; and that it must be from these two individuals that, owing to transplantation, together with the combined action of aliment and climate, the fifty-four monkeys represented on our chart have originated. It is, notwithstanding, sufficiently strange, that, under such circumstances, this 'primordial organic type' of monkey should have so highly improved in Guinea, and in Malayana, as to become *gorillas* and *chimpanzees*, *orangs* and *gibbons*; whereas on the contrary, the descendants of 'Adam and Eve' have, in the same localities, actually deteriorated into the most degraded and abject forms of humanity." In reality, however, whatever may be said about the possibility of such simian development, the possible human deterioration is an inevitable attribute of the rational, moral free-agent, man; capable of the noblest aspirations and of wondrous intellectual development, but also with a capacity for moral degradation such as belongs to him alone of all created beings. The one characteristic, as well as the other, separates man by an impassable barrier from all those other living creatures, that might appear in some respects gifted with endowments akin to his own.

Man, as a tool-using artificer, seems to have a rival in the beaver, felling its timber, carrying its clay, and building its dam; in the spider weaving its web, more perfect than any net of human fisher; and even in the squirrel with its provident hoard of well-secured winter store, or the monkey employing the cocoa-nut and other shell-fruit as missiles. But even in such artificial appli-

ances there is nothing obsolete, nothing inventive, nothing progressive; neither is there any deterioration. Their most wonderful arts, as the cell of the bee, the web of the spider, or the beaver's dam, are executed without a lesson, and are improved by no experience. The bee emerges into its last stage of perfect life, or the spider is hatched from its egg, and proceeds to do without any instruction, what we could scarcely attempt after much training; whereas the child born amid the most highly developed civilisation—the son of a Watt, a Stephenson, a Brunel,—if reared from infancy to manhood, without any knowledge of mechanical science, or the industrial arts, would start anew from the rudimentary instincts of the tool-using animal, and expend his ingenuity, not perhaps without some traces of hereditary mechanical genius, on the primitive materials of flint, stone, horn, or shell.

Man depends for all on his teachers; and when moral and intellectual deterioration returns him to the toolless condition of the totally uncivilized nomade, he is thrown back on the resources of his primary instincts, and reaches that point from which the primeval colonist has had to start anew in all lands, and work his way upwards, through stone, and bronze, and iron periods, into the full co-operation of a civilized community, treasuring the experience of the past, and making for itself a new and higher future.

The periods of the archæologist, thus designated as THE STONE PERIOD, THE BRONZE PERIOD, and THE IRON PERIOD, have been brought into some discredit, in part by what, as a general system, must be regarded only as a hypothesis, being assumed by some who have adopted it, as involving facts of no less indisputable and universal application than the periods of the geologist. In part also, they owe their non-acceptance to wilful errors of

their impugners, and to the want of appreciation of the inevitable characteristics which pertain to transitional periods, such as chiefly come under the European archæologist's observation. So far as the aboriginal American is concerned, the New World is in its earliest transitional state still: that of a stone period, very partially affected by the introduction of foreign-wrought weapons and implements, and in no degree indicating, among the numerous tribes of North America, any traces of the adoption of a superinduced native metallurgy. Such therefore has appeared to me an actual condition of things, the study of which, and its comparison with the traces of a corresponding stage in the early ages of Britain, may be of some use in clearing the subject from much confusion which, from various causes, has gathered round it.

The special characteristics of the native civilisation, which the early Spanish adventurers found already existing in Mexico and Central America, will come under review at a later stage; but it cannot admit of question that throughout the whole Red Indian forest-area metallurgic arts were unknown, as they still are among the Indians of the North-west after an intercourse of upwards of three centuries and a half with Europeans. Copper, indeed, was wrought and used among them, but it was used without any application of fire, and as what may be most fitly designated a mere malleable stone. In Britain, as I have already observed, "it is not impossible that the working of gold may have preceded the age of bronze, that is the first true age of metallurgy, and in reality have belonged to its stone-period. If metal could be found capable of being wrought and fashioned without smelting or moulding, its use was perfectly compatible with the simple arts of the stone-period. Of such use, masses of native gold, such as have been often found both

in the Old and the New World, are peculiarly susceptible; and some of the examples of Scottish gold personal ornaments fully correspond with the probable results of such an anticipatory use of the metals."[1] The idea thus formed from an examination of some of the most primitive and artless examples of primeval British goldsmiths' work, has been amply confirmed by later opportunities of observing the mode of using the native copper, and the traces of its former workings, among the American Indians; and to this day their highest attainment in metallurgic skill extends only to grinding the iron hoops which the Hudson's Bay fur-traders supply them with, into knives, lance and arrow heads, and the like substitutes for the older implements which they chipped out of the flint, or ground from the broken stone. Further opportunities will occur for illustrating this subject; which is full of interest to the ethnologist from the light it throws on the rate of progress of a barbarous people towards civilisation: or rather on the capacity of man in a certain undeveloped stage, for witnessing the most remarkable products of the useful arts, without evincing any desire to master them. To the historian, who has so frequently to consider, both in ancient and modern history, the immediate and remoter results of the contact of a highly civilized people with one in such a primitive condition, some of the bearings of this inquiry cannot be without their value.

After centuries devoted to the elucidation of Roman remains, and the assignment to Roman artificers of much which the more discriminating classification of recent years awards to totally different workmen, the existence of a singular class of rude primitive weapons and implements, made of stone, shell, or bone, in nearly every quarter of the globe, has at length excited a very general

[1] *Prehistoric Annals of Scotland*, p. 214.

interest among the archæologists of Europe. Made, as these simple relics of primitive art are, of the most readily wrought materials, and by the constructive instincts rather than the acquired skill of their rude artificers, they belong to one condition of man, in relation to the progress of civilisation, though pertaining to many periods of the world's history, and the most widely-separated areas of the globe. In one respect, however, though not in this one alone, such relics possess a peculiar value to the ethnologist, when searching into the primeval condition of our race. The materials of such infantile processes of manufacture have within themselves, most frequently, the evidences of their geographical origin, and in some of them also of their chronological eras. The periods to which numerous ancient sepulchral, and other British and European relics pertain, may frequently be determined, like those of inferior and older strata, by their accompanying imbedded or buried fossils. The bones of the *Bos primigenius* have been found indented with the primitive stone javelin of the aborigines of Northern Europe, and dug up alongside of the traces of British sepulture. Those of the *Megaceros Hibernicus* seem, in like manner, to be traced to a period of ancient Irish colonization, when stone hatchets and rude pottery prove the simple character of its native arts; while other evidence satisfies the palæontologist that the same Irish elk—thus seen, as it were, in its closing epoch, and immediately before its final extinction,—was contemporaneous with the mastodon, the mammoth, and the fossil carnivora of the caverns. The *Bos longifrons*, doubtless, traces its descent from an ancestry not less ancient; but from its wild herds the native Briton appears to have derived his domesticated cattle, and its relics pertain to an era little later than the Roman times. The ornamented tusks of the wild boar, the bones of the brown

bear, the teeth and skulls of the beaver, the carvings wrought from the walrus ivory, the skates formed from the metatarsal and metacarpal bones of the red-deer and small native horse, with numerous kindred relics of palæontology within the era of the occupation of the British Islands by man, all serve to assign approximate dates to the examples of his ancient arts which they accompany. Thus within the historic period, as in geological eras prior to the creation of man, the progress of time is recorded by the extinction of races. His advent on our earth was speedily marked by the disappearance of numerous groups of ancient life which pertain to that transitional era where geology closes and archæology begins; though the more recent discoveries of the traces of human arts along with the fossil mammals of the drift, confirm, by new and more striking evidence, the fact that man entered on this terrestrial stage, not as the highest in an entirely new order of creation, and belonging to an epoch detached by some overwhelming catastrophe from all preceding periods of organic life; but that, while the earth moved through its orbit in calm obedience to laws which still govern its course, he appeared as the last and best of an order of animated beings whose line sweeps back into the shadows of an unmeasured past. And as it was of old, so is it still:

> "The old order changeth, yielding place to new,
> And God fulfils himself in many ways,
> Lest one good custom should corrupt the world."

The disclosures of British tumuli and chance deposits suggest strongly the belief that the Celtic Briton was himself an intruder upon older allophylian occupants; while the intrusion of the Roman into Celtic Britain is recorded for us in the extinction of many of its ancient fauna, as well as of whole British tribes. What the Roman partially accomplished, the Saxon, the Dane,

and the Norman completed; displacing the Celtic Briton from all but the fastnesses of Wales, and gradually extirpating all but such animals as are either perfectly compatible with the free development of the highest social refinement, or are worthy of protection as a means of ministering to man's pleasures. And as it has been in the Old World, so is it in the New. The progress of the European colonists not only involves the extirpation alike of the wild animals and the forests which formed their natural haunts, but also the no less inevitable disappearance of the aborigines who made of them a prey; and thus the grave-mound of the Red Indian, and the relics of his simple arts, become the memorials of an extinct order of things no less clearly defined than the post-tertiary fossils of the drift.

But while the remains of extinct species thus serve, like the graven Roman or runic inscriptions on the sepulchral slab, to determine the periods at which certain eras had their close, other accompanying objects, and chiefly the traces of living or extinct fauna, are no less valuable as fixing the geographical origin of the ancient colonists, amid whose relics they are found; just as the elephants, the camels, the monkeys, and baboons of the Nimrod obelisk, or the corresponding sculptures on the walls of Memphis or Luxor, indicate the countries whence tribute was brought, or captives were carried off, to aggrandize the Assyrian or Egyptian conquerors. Among such relics, which serve to fix the geographical centres of ancient arts, the sources of early commerce, or the birthplaces of migrating races, might be noted the tin and amber of the Old, and the copper of the New World. So also in minuter analysis, we recognise among primitive American relics the local origin of various favourite materials: as the Mexican obsidian, the clay-slate of the Babeens, the favourite red

pipe-stone, or *Catlinite*, of the Couteau des prairies, and the pyrulæ and conch-shells of the Gulf of Florida, found mingling with the aboriginal relics of ancient tribes in the islands and on the north shores of the great Canadian lakes, along the southern slope of the same water-shed whence the Moose and the Abbitibbe pour their waters into the frozen sea of Hudson's Bay.

The designation applied to the primitive condition of the economic or industrial arts, properly signifies, as has been already sufficiently clearly indicated, that primeval condition in which, in the absence of metals, and the ignorance of the simplest rudiments of metallurgy, man has to find materials for the manufacture of his tools, and the supply of his mechanical requirements, in the commoner objects which nature places within his reach. The mere recognition of the convenient uses to which the malleable native metals could be applied as substitutes for stone, can scarcely be regarded as even an initial step in the transition towards the first true metallurgic period. This cannot be considered to have been introduced until the native copper-worker had perceived the wonderful transformations which could be wrought by fire, and had learned at least to melt the pure metal, and to mould the weapons and implements he required, if not to harden it with alloys, and to quarry and smelt the unfamiliar ores. But in the great archipelago of the Caribbean Sea, as well as in the widely-scattered islands of the Southern Pacific, the primeval stage of native art might more correctly be designated a shell-period; for the large shells which the mollusca of the neighbouring oceans produce in great abundance, supplied the native artificer with his most convenient and easily-wrought raw material, and in reality left him at no disadvantage as an artificer, when compared with the Indian of the copper regions on the

shores of Lake Superior. The ethnographic phases of conchology, accordingly, present an exceedingly varied and attractive study, to those by whom such indications of the initial development of the artistic instincts of man are recognised as involving not only an important element in his natural history, but also occasional glimpses of facts not without their value in the introductory chapters of civil history.

Among the productions of nature employed as materials for ornament and use, scarcely any have commanded more universal acceptance than the shells which abound, under such varied forms, on every sea-coast, as well as in the deposits of fresh-water lakes and rivers. To the conchologist they present an interesting and singularly beautiful department of nature, inviting to research amid their seemingly endless forms, and to inquiry into the habits of the "living will" that once tenanted each lovely cell:—

> "Did he stand at the diamond door
> Of his house in a rainbow frill?
> Did he push, when he was uncurl'd,
> A golden foot or a fairy horn
> Thro' his dim water-world?"[1]

To the geologist the shells of the testaceous molluscs offer a department in palæontology of very wide application and peculiar value. They constitute, indeed, one of the most important among those records which the earth's crust discloses, whereby its geological history can be deciphered; and to their value in this respect reference has already been made. But it is to the special phases of interest which they possess for the ethnologist and archæologist, in their inquiries into the history of man and his arts, that attention is now directed. The mere beauty and variety of many marine shells sufficiently

[1] Tennyson's *Maud*.

account for their selection as objects prized for personal ornament; while their large and solid structure, and the readiness with which their substance can be wrought into a variety of forms, must have suggested their employment in the earliest stages of insular art. Thus they became the natural substitute for the still unknown commoner metals; while, like the precious metals, shells have been used, both in the Old and New World, not only for ornament, but as the most primitive forms of a recognised currency. Of such the *Cypræa moneta* is the most familiar. The cowrie-shells used as currency are procured on the coast of Congo, and in the Philippine and Maldive Islands. Of the latter, indeed, they constitute the chief article of export. At what remote date, or at what early stage of rudimentary civilisation this singular representative shell-currency was introduced, it is perhaps vain to inquire, but the extensive area over which it has long been recognised proves its great antiquity. The Philippine Islands form, in part, the eastern boundary of the Southern Pacific, and the Maldives lie off the Malabar coast in the Indian Ocean; but their native shells circulate as currency not only through Southern Asia, but far into the African continent.

Corresponding to this cowrie-currency of Asia and Africa, is the use, by the American Indians of the Northwest, of the Ioqua, or *Dentalium*, a shell found on the neighbouring shores of the Pacific, and employed by them both for ornament and as money. The Chinooks and other Indians of the Northern Pacific Coast wear long strings of ioqua shells as necklaces and fringes to their robes. These are said to be procured only at Cape Flattery, at the entrance of the Straits of De Fuca, where they are obtained by a process of dredging, and have a value assigned to them increasing in proportion to their size. This varies from about an inch and a half to up-

wards of two inches in length. They are white, conical, and slightly curved in form, and taper to a point. Their circumference at the widest part does not greatly exceed the stem of a clay tobacco-pipe, and they are thin and translucent. Mr. Paul Kane, the author of *Wanderings of an Artist among the Indians of North America*, writes to me in reference to them: "A great trade is carried on among all the tribes in the neighbourhood of Vancouver's Island, through the medium of these shells. They are valuable in proportion to their length, and their value increases according to a fixed ratio, forty shells being the standard number required to extend a fathom's length. A fathom thus tested is equal in value to a beaver's skin, but if shells can be found so far in excess of the ordinary standard that thirty-nine are long enough to make the fathom, it is worth two beavers' skins; if thirty-eight, three beavers' skins, and so on; increasing in value one beaver skin for every shell less than the standard number."

No evidence appears to indicate the use of the marine or fresh-water shells of Europe as a species of currency during its primitive era; but it is interesting to notice the fact, that the same simple mode of employing the spoils of the sea for personal decoration, as is found prevalent among the rude Indians of the North-west at the present day, prevailed among the primitive occupants of the British Isles in that dim dawn of their primeval history revealed by the disclosures of their most ancient sepulchral deposits. Among the personal ornaments found in early British graves, seemingly pertaining to a period long prior to the acquisition of the simplest metallurgic arts, are necklaces formed of the small shells abounding on the neighbouring coasts, such as the *Nerita littoralis*, the *Patella vulgata*, and others equally common at the present day. These are perforated like the

ioqua shells of the Chinook Indian, apparently by the simple process of rubbing the projecting point on a stone, and, thus converted into shell-beads, they were strung together with a fibre or sinew. It may also be noted that, as among the Indians of this continent such personal ornaments are not confined to the squaws, but more frequently adorn the person of the brave, and mingle with the scalp-locks and other war-trophies of the most celebrated chief, so was it with the Allophylian of Britain. The bead necklace occurs alongside of the stone war-hatchet and flint lance-head, as the property of the warrior, and one of his most prized decorations. Possibly, indeed, such may have constituted symbols of rank, and the special badges of office, as considerable variety marks their forms.

A peculiarly interesting illustration of the use of shells for such purposes of personal decoration, by the Allophylian of the British Islands, during their primitive stone-period, is furnished by a discovery made in the year 1838, during the progress of improvements in the Phœnix Park, Dublin. An elevated knoll, known by the name of Knock-Maraidhe, or the Hill of the Mariners, was ordered by the superintending officer of the Royal Engineers to be levelled, when it was discovered that it was an artificial sepulchral mound, one hundred and twenty feet in diameter, and fifteen feet in height, concealing a cromlech, or megalithic tomb, composed of massive unhewn stones. Within this sepulchral chamber were found two male skeletons, with traces of other bones, including one supposed to be that of a dog. From the dimensions of the enclosed chamber, it was manifest that the bodies had been interred in the contracted position common in early British sepulture; and immediately under each skull lay a quantity of the common littoral shells, *Nerita littoralis*. These had been rubbed down

on the valve, so as to make a second hole, for the purpose of being strung together to form necklaces, and the remains of vegetable fibre were discovered along with them, a portion of which was through the shells. Alongside of these, also, lay a knife or arrow-head of flint, and a double-headed pin, neatly formed of bone, but no traces of metallurgic arts. In the outer verge of the tumulus, four stone-cists were also discovered, each containing a small sepulchral vase, and calcined bones. The sepulchre evidently contained the bodies of one or perhaps two distinguished chiefs, to whom were accorded the most costly funeral honours of primitive times. The surrounding urns with their incinerated remains, and possibly also one of the skeletons in the megalithic chamber, point to the practice of human sacrifice, when the subordinate officer, the wives, and slaves perished beside the bier of the great warrior, that they might pass with him to the world of spirits, there to renew the same servile offices they had performed on earth. Such examples of primitive sepulture have been repeatedly brought to light, and amply correspond with the barbarian ideas of the most lavish honours to the illustrious dead. Manifestly neither labour nor cost was spared. The huge megalithic chamber of the dead was reared, the ornamental cinerary urns were prepared, the bodies of the attendant victims were consumed on the pile, and their remains deposited with the urns in the surrounding cists, and then the earthen pyramid was laboriously piled over the whole, and the costly structure hidden for ages from the light of day. The occurrence exclusively of weapons, implements, and ornaments of the stone-period in such tombs is one of the strongest arguments that it was an absolute stone-period, without even the first transitional traces of metallurgic arts; and this idea which I was led to form from the investigation of primitive British graves, has been strongly

confirmed by the proofs of the lavish expenditure of the most costly treasures of the American Indian in his sepulchral depositories. In the Huron grave-mounds of the Georgian Bay lie the tropical shells of the Gulf of Florida, the carved pipe-head, the stone hatchet, and flint arrow-head, and along with these the copper kettle, the iron knife, and other metallic treasures acquired from the old French traders. So also among the Chinook and Cowlitz Indians on the Columbia and Cowlitz rivers, the honoured dead is deposited in his elaborately decorated canoe, with not only his native bow and arrows, his spear, paddle, and personal ornaments, but with the iron tomahawk, copper kettle, gun, and others of the most prized objects acquired from the Hudson's Bay factors, laid beside him. It may therefore be assumed that it was not because the copper, bronze, or iron weapon or implement was too costly a sacrifice to deposit in the megalithic tomb, that such so frequently discloses only the stone hammer or celt, the flint lance-head, the shell necklace, etc., but because these alone constituted the implements and personal ornaments of the era.

Neither the cromlech nor the large tumulus can be regarded as a common grave, but as the laborious and costly monumental structure erected over the illustrious dead. Some of them must have occupied the labour of months, and engaged the services of a numerous corps of workmen, not hired as mercenary labourers, but either compelled by some commanding authority, or more probably heartily uniting in a willing service. They reveal to us interesting glimpses of the ideas of a future state existing among the Allophylians of Britain and the neighbouring continent, in the remote era to which such sepulchral memorials pertain, while they disclose striking analogies in the development of human thought and belief under corresponding social conditions. The old

pagan Northman anticipated an elysium in which the joys of endless war-triumphs were to alternate with the feastings of the Valhalla of the gods; the luxurious Asiatic dreams of the sensual joys of his Mahometan Paradise; while the Red Indian looks forward to the range of ampler hunting-grounds, and to unfailing victory on the war-path. All however anticipate a corporeal participation in joys akin to those which constituted their chief pleasures on earth, and nearly all conceive of the distinctions of social rank perpetuated beyond the grave. Hence the slaughter of the dog and horse of the chief, and their interment beside him; and hence also the cruel suttee, which Cæsar tells us prevailed among the Gauls, who consumed on the same funeral pile with their most honoured dead, not only the objects they had held in most esteem when alive, including their dogs and horses, but also their favourite retainers. Along with these were also laid the bow and spear, the sword, shield, and other indispensable implements of war and the chase; but the disclosures of later British graves frequently show the beautiful bronze sword broken ere it was deposited beside the dead, and precisely the same custom prevails among the American Indians. The copper kettle is perforated, the gun is deprived of its lock or otherwise rendered unserviceable, and all the objects destined for use in another state of existence are rendered useless for the life in which their employment has come to an end. In all this a strangely simple and child-like confusion of ideas is discernible, presenting many analogies to those which may still be discerned in our own rustic legends and popular superstitions. Many of the most touching passages of homely pathos and tenderness to be met with in the old Scottish Ballads, betray the same undefined mixture of primitive superstition with the difficulty, still experienced by the popular

mind, in conceiving any clear idea of a disembodied spirit, or of death distinct from the grave. Alike in the conception of the primeval barbarian, and in the uncultured rustic mind, the grave is not only the portal to the spirit-land, but the sole spirit-world.

A reference to some of the customs of the Chinook Indians of the Columbia river will illustrate the prevailing ideas relative to the rites of the dead, and to a future life, which seem to find nearly universal acceptance from the barbarian mind. The Chinooks are among the most remarkable of the flat-head Indians, and carry the strange process of cranial distortion to a great extent. They are in some respects a superior race, making slaves of other tribes, and evincing considerable skill in such arts as are required in their wild forest and coast life. Their chief war implements are bows and arrows, the former made from the yew-tree, and the latter feathered and pointed with bone. Their canoes, hollowed out of the trunk of the cedar-tree, are frequently very large, as the cedar grows to an immense size in the native territory of the tribe. They are made exceedingly light, and ornamented with much taste and skill. In such a canoe the dead Chinook chief is deposited, surrounded with all the requisites for war, or the favourite occupations of life: presenting a remarkable correspondence in his sepulchral rites to those of the ancient pagan viking, who, as appears alike from the contents of the Scandinavian *Skibssætninger*, and from the narratives of the Sagas, was interred or consumed in his war-galley, and the form of that favourite scene of his ocean triumphs perpetuated in the earth-work that covered his ashes. Tin cups, copper kettles, plates, pieces of cotton, red cloth, and furs, and in fact everything which the Chinooks themselves most value, or which are most difficult to obtain, are hung round the canoe. Beside the body they

place paddles, spears, bows and arrows, and food, with everything else which they consider necessary for a very long journey. Beads, ioqua shells, brass buttons, and small coins are even placed in the mouth of the dead. The canoe is then ready to be conveyed to the burial-place of the tribe, generally selected for its isolated situation. The two principal cemeteries are rocky islands in the lower part of the Columbia river, both of which were visited and sketched by Mr. Paul Kane, from whom my information on the customs here described is chiefly derived. One is called Coffin Rock from the appearance it presents, covered with the raised biers of the deceased members of the tribe. The funeral cortege has an imposing character. The deceased is carefully disposed in his canoe-bier, surrounded by the articles intended for his use in the life beyond the grave. The attendant mourners then assemble in their canoes, and that of the deceased is towed to the island cemetery of the tribe, and there either fastened to the branches of a tree, or raised on a scaffolding of strong cedar boards and poles, four or five feet from the ground. A roll of bark is placed over it to protect the body from the rain, and the various offerings to the dead are disposed about the bier. The final act before leaving is to bore holes in the bottom of the canoe; and in like manner every article left with the corpse is mutilated and rendered useless. The belief of the Indian is, that while their use on earth is thereby at an end, the Great Spirit will restore them to perfection on the arrival of the deceased at their elysian hunting-grounds. Among the greatest crimes which an Indian can commit in the eyes of his tribe is the desecration of one of those canoe-biers; and its perpetration, if discovered, is certain to be visited by death. Instances of such sacrilege are accordingly of rare occurrence; but one happened a few years since, to which

attention was directed by the robber of the sepulchral canoe being shot dead within the precincts of Fort Vancouver, by order of Casenov, the chief of the Chinook Indians.

The favourite son of this chief died, and, contrary to the wonted custom of his tribe, he had him buried in the cemetery attached to Fort Vancouver. The sepulchral rites, and still more the subsequent proceedings of the bereaved chief, presented a singular admixture of Christian sepulture with the ineradicable superstitions of the wild Indian. The coffin was made sufficiently large to contain all the necessaries supposed to be required for his comfort and convenience in the world of spirits. The chaplain of the Fort read the usual service at the grave, and after the conclusion of the ceremony, Casenov returned to his lodge, and the same evening attempted the life of his boy's mother, who was the daughter of the great one-eyed chief generally known as King Comcomly, alluded to in Washington Irving's *Astoria*. The unfortunate mother had devotedly nursed her son during his sickness, and was moreover the favourite wife of the Chinook chief. But this only furnished additional motives for her destruction; for, it is the general belief of the Indians of the North-west, that the severer the privation they inflict upon themselves the greater is the manifestation of their grief, and the more pleasing to the departed spirit. Casenov stated to Mr. Kane, that as he knew his wife had been so useful to her son, and so necessary to his happiness and comfort in this world, he wished to send her with him as his companion on his long journey. The reason thus assigned by the Chinook chief for the murder of his favourite wife over the grave of their son, gives a curious insight into the motives of such barbarous sacrificial rites; exhibiting as they do so strange a mixture

of good and evil, of generous self-denial and cruel selfishness. The encircling cists and cinerary urns of the Knock-Maraidhe, and probably also some of the contents of the megalithic chamber in its centre, seem strongly suggestive of the idea of similar sacrifices having prevailed among the ancient occupants of the British Isles. Such a laboriously constructed vault and earthen pyramid were manifestly parts of one grand mausoleum; and if we suppose the whole structure, with its included cromlech, cists, and urns, to have been completed together, it is difficult to conceive of any other mode of accounting for such a sepulchral group than the one suggested, which is so congenial to the ideas of barbarian rank, and of earthly distinctions perpetuated beyond the grave.

Looking at the subject, however, from another point of view, we perceive that the various tribes of Indians, who originally possessed only weapons, implements, and personal ornaments of bone, shell, flint, and stone, or at most of native copper, rudely hammered into shape, are seen after an interval of upwards of three centuries of European colonization and traffic, without the slightest acquired knowledge of working in metals, but possessed of numerous metal implements and weapons, which, as their greatest treasures, they freely lavish on the loved or honoured dead. Such traces of metallurgy, it is manifest, afford no proof of an acquired native art. The copper kettle of the Chinook coffin-bier on the Columbia river, was in all probability brought, not from the copper regions of Lake Superior, but from London or Liverpool, along with the beads, knives, hatchets, and other objects of barter, by means of which the fur-traders carry on their traffic with the Indian hunter. At most these only prove that a nation, still in its stone-period, and totally ignorant of any further

metallurgic art than is required to grind an iron hoop into lance or arrow-heads, has been brought into contact with a civilized people, familiar with metallurgy and many acquired arts, such as the musket and the rifle may most aptly symbolize.

Among the Indian tribes of North America, as observed in the comparison of others met with in a similarly rude and undeveloped intellectual condition elsewhere, considerable diversity of inventive genius and artistic skill is discernible: some of them showing an instinctive aptitude for constructive, and others for imitative arts. The mode in which the latter specially manifests itself among many of the tribes of American aborigines is well worthy of note, and will come under review when referring to the pipe manufacture which is so curiously typical of American art. But meanwhile an equally instructive illustration of what may thus be designated æsthetic and constructive instincts may be selected from the diversely gifted islanders of the Southern Pacific. On the extreme western verge of the Polynesian archipelago lie the Feejee Islands, occupied by a people remarkable among the islanders of the Southern Pacific alike for physical and intellectual peculiarities. The Feejeean physiognomy is described as presenting general characteristics of debasement, when compared with that of the true Polynesian, and the entire proportions and contour of his figure are markedly inferior to those of the Friendly and Navigator islanders. This is the more remarkable in a people dwelling in the midst of abundance, and enjoying an unusual variety of choice articles of food. Their ferocious and treacherous habits, however, and the hideous customs of cannibalism and systematic parricide, with the attendant crimes inevitable in such a social condition, render the Feejeean Islands, which seem fitted by nature to be the abodes of happi-

ness, among the most wretched scenes of moral degradation. Nevertheless it is in this strange island group that the arts of the South Pacific appear to have their origin and highest development. Dr. Pickering, after enjoying abundant opportunities of observation in the Southern Pacific, appears to look on the Negrillos as the true inventive race, from whom the Feejeeans, who are unquestionably allied to them in blood, acquired, elaborated, and greatly improved many applications of art and skill. But the ingenious Negrillo is altogether unsocial and prone to isolation, and the Feejeean appears to derive from him a dislike of change, and a disinclination to leave his island-home. It required, therefore, the intervention of a migratory or aggressive race to diffuse the acquired knowledge and skill of the Feejeeans; and this colonizing race of the Southern Pacific and of the Indian Oceans appears to be the Malayans, who are found in contact with many diverse and widely-scattered nations, and are of a roving disposition, the proper children of the sea. "Naturally," says Dr. Pickering, "the most amiable of mankind, they are free from antipathies of race, are fond of novelty, inclined rather to follow than to lead, and in every respect seem qualified to become a medium of communication between the different branches of the human family." Such a race of plastic, amphibious mediators being found, a curious light is thrown on the diffusion of knowledge and the primitive arts throughout the widely-scattered island groups of the Southern Pacific, where almost every Polynesian art, it is said, can be distinctly traced to the Feejee Islands, while the Feejeean himself is so averse to roam. But the best and the worst characteristics of the Feejee islanders are strangely intermingled. They use the bow and throw the javelin with great dexterity, but their peculiar and distinguishing weapon is a short

missile club, which they all habitually wear stuck in their belt, the symbolic Feejeean tool and national instrument of assassination. Nevertheless it is an error, which many analogies of history tend to confute, if we assume the occurrence of moral degradation, as manifested in parricide, cannibalism, and systematic treachery and assassination, to be necessarily incompatible with such intellectual development as distinguishes the Feejeean from other islanders of the Pacific. The ferocious New Zealander has proved the most capable of civilisation of all the aborigines of the Pacific, and is found moreover to possess a traditional poetry and mythical legends of a highly striking and peculiar character. And turning from the primitive and still undeveloped races of the world, we have only to study the chronicles of ferocious deeds perpetrated by the pagan Saxon, the Hun, or the later Dane and Norseman, to see in what hideous aspects the wild energies of a rude people may alone manifest themselves, who shall nevertheless prove capable of becoming the leaders in the civilisation of Europe. To judge by the monkish chronicles, no Feejee cannibal could surpass, either in savage atrocity or in hideousness of aspect, the Hungarian or Northman from whom the proudest of Europe's nobles claim descent. The chroniclers of Germany, France, and Italy, describe the fury of the former with dolorous brevity, while popular legend depicts them as grinning, child-devouring ogres, whetting their ensanguined tusks over their prey; and the liturgy of the Gallican Church of the ninth century preserves the memorial of the pagan Northmen's ravages in the new supplication added to its litany: *A furore Normannorum libera nos.*

It is obvious therefore that all the savage vices of the Feejeeans are perfectly compatible with considerable skill in such arts as pertain to their primitive and insular

condition. Their musical instruments are superior to those of the Polynesians, and include the Pan-pipe and others unknown in the islands beyond their range. Their pottery also exhibits great variety of form, and includes examples of vessels combined in groups, presenting a curious correspondence to similar productions of Peruvian art. Their fishing-nets and lines are remarkable for their neat and skilful workmanship, and they carry cultivation to a considerable extent. "Indeed," remarks the ethnologist of the United States Expedition, in summing up the characteristics of the Feejeeans, "we soon began to perceive that the people were in possession of almost every art known to the Polynesians, and of many others besides. The highly-finished workmanship was unexpected, everything being executed until recently, and even now for the most part, without the use of iron. In the collection of implements and manufactures brought home by the Expedition, the observer will distinguish in the Feejeean division something like a school of arts for the other Pacific islands." In such a strangely-gifted savage race we see at once the degradation of which human nature is susceptible, and yet at the same time the germs of constructive and artistic capacity, capable of development into many marvellous manifestations, if once subjected to such elevating influences as changed the cruel pagan, the merciless pirate of the northern seas, into the refined Norman, the chivalrous crusader, and the imaginative troubadour.

The members of the United States Exploring Expedition were struck, as they approached the extensive coral archipelago, interposed between the Marquesas, Society, and Gambier groups of islands, by the small and slight canoes, seemingly emerging from the sea, with a projecting beak at stem and stern, and propelled by means of a paddle remarkable for its curved blade. In these

small low canoes the islanders moved with great rapidity through the water, while they formed such a speck on its surface that they were close to the ship before they were observed; but all idea of rudeness in the construction of these canoes and paddles gave way to wonder and admiration of their makers when the voyagers acquired possession of the implements with which they wrought. The cocoa-palm supplies them with materials for matting and weaving, and the cassytha stems and cocoa-nut fibre are plaited into cord. The finer cord is made of human hair, and bones of the turtle and of the larger fish supply them with the means of making fish-spears and hooks. But there is no natural production on those coral islands harder than shell or coral, and from these the whole constructive tools of the islanders have to be made. When it is thus seen that a population can exist and develop ingenious arts amid such privation of all that seems indispensable to the rudest attempts at constructive ingenuity; it need not be wondered that we should find such abundant traces of a non-metallurgic European era, during which the primitive nomadic colonists applied their far ampler resources of flint, stone, horn, and bone, to all the purposes for which the metals have been adapted in later times, and with no consciousness of privation in the unknown want of metallurgic arts. To the absence of such knowledge among the world's primitive wanderers, or to the want of the metals themselves, and even their more abundant mineral substitutes, as among the occupants of the volcanic and coral islands of the Pacific, may be traced the ingenious adaptation of sea-shells to many of the economic and artistic uses to which they have been so extensively applied. Such applications of the beautiful ocean shells, in many cases to purposes seemingly so foreign to their natural use, illustrate in a striking manner the adapta-

bility of man to the most varied physical conditions of the globe, and frequently exhibit the imperfectly-developed reasoning faculties of the savage, working within narrow limits, akin to the instincts of the lower animals. Thus we find curious affinities between the rude primitive arts of the European savage in the dim dawn of the ancient world, the equally rude arts of the Carib or the Guanche of the Antilles when brought to our knowledge in the fifteenth century, and the simple devices of the Polynesians occupying the Volcanic or Coral Islands of the Southern Pacific Ocean, first visited by Europeans in the eighteenth century. In the Paumotu group, and others of the coralline formations of the Pacific, we see islands crowded with population, while deprived by nature of all the means which seem to us the indispensable elements of civilisation, if not, indeed, of existence. With them, in the absence not only of metals, but even of stone and wood, marine shells form the most important available material alike for economic utility and ornament; and the same appears to have been the case, to a great extent, among the Indians of the Antilles before the time of Columbus. The extreme beauty of many of the marine productions of the tropics and the Southern Ocean, sufficiently accounts for their adoption for personal adornment, as in the case of the *Cypræa aurantia*, or beautiful orange cowrie, of which specimens are rarely to be met with which are not perforated, owing to its use as a favourite ornament of the natives of the Friendly Islands. But these spoils of the ocean acquire an additional value, when, as in Central Africa, or among the American Indians around the head-waters of the Mississippi, they have all the added virtues which rarity confers. Dr. Livingston, when leaving the Belondas after a brief sojourn among them, thus records his friendly parting with their chief: "As the last proof of

friendship, Shinte came into my tent, though it could scarcely contain more than one person, looked at all the curiosities, the quicksilver, the looking-glass, books, hair-brushes, comb, watch, etc. etc., with the greatest interest; then closing the tent, so that none of his people might see the extravagance of which he was about to be guilty, he drew out from his clothing a string of beads, and the end of a conical shell, which is considered, in regions far from the sea, of as great value as the Lord Mayor's badge is in London. He hung it round my neck, and said, 'There, now, you have a proof of my friendship.' My men informed me that these shells—a species of conidæ,—are so highly valued in this quarter as evidences of distinction, that for two of them a slave might be bought, and five would be considered a handsome price for an elephant's tusk worth ten pounds." But even more curious is it when such sea-wrought treasures are found employed not as the ornaments, but as the substitutes for dress, as among the natives of Darnley Island, an island of volcanic origin, off the coast of New Guinea, visited by Her Majesty's ship "Fly" in 1842-46. The natives are described as fine, active, well-made fellows, rather above the middle height, of a dark brown or chocolate colour. "They had frequently almost handsome faces, aquiline noses, rather broad about the nostrils, well-shaped heads, and many had a singularly Jewish cast of features. They were entirely naked, but frequently wore ornaments made of mother-of-pearl shells, either circular or crescent shaped, hanging round their necks. Occasionally, also, we saw a part of a large shell, apparently a cassis, cut into a projecting shield-shape, worn in front of the groin." Among these islanders also, the larger sea-shells have to perform the functions which are so abundantly provided for, in the Western Archipelago, by the calabash. Their adapta-

bility for this purpose, indeed, naturally suggests such an application of them wherever they abound, as in the case of the *Buccinum dolium*, frequently used by the fishermen and mariners of the tropics as a convenient utensil with which to bale their boats. So in like manner the graceful trumpet-like form, and richly-variegated colours, of the larger species of the tritons, such as the beautiful *Triton variegatus*, render their early and independent application as horns or musical instruments, alike by the islanders of the Pacific and the Caribbean seas, sufficiently natural and obvious.

Though the natives of the Antilles, when first visited by the Spaniards, possessed some natural advantages over the inhabitants of the volcanic and coral islands of the Pacific, yet the large marine shells with which the neighbouring seas abound, constituted an important source for the raw material of their primitive implements and manufactures. The great size, and the facility of workmanship of the widely-diffused *pyrulæ*, *turbinella*, *strombi*, and others of the larger shells, have indeed led to their application, wherever they abound among uncivilized nations, to numerous purposes elsewhere supplied from other sources. Of such, the Caribs made knives, lances, and harpoons, as well as personal ornaments; while the mollusc itself was sought for and prized as food. The *Strombus gigas* is still fished for the table off the island of Barbadoes; and numerous ancient weapons and implements made from its shell have been dug up on the island. An interesting collection, illustrative of the character of such primitive manufactures of the Antilles, has been presented to me by Dr. Bovell, by whom they were dug up with other Carib relics, on the island of Barbadoes, where traces of the mixed blood of aboriginal Caribs continued till very recently to mark a portion of the coloured population of the

island. From these the accompanying illustrations are selected.

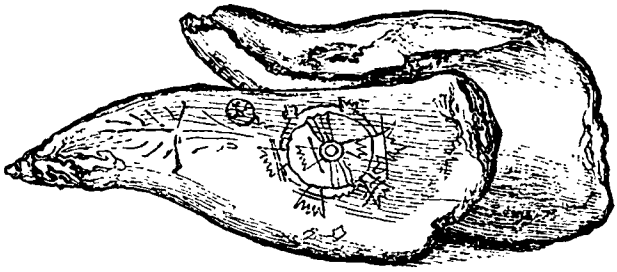


FIG. 6.—Carib Knives.

The Carib aborigines of the Antilles furnish a striking example of what the more active manifestations of moral degradation really imply. Compared with the gentle, passive Indians met by the Spaniards on the first islands of the west visited by European explorers, the Caribs were a cruel and fierce race of cannibals, as hateful in all their most salient characteristics as the earlier New Zealanders or Feejeeans. Yet time has proved, even under very unfavourable circumstances for the development of Carib civilisation, that the fierceness and aggressive cruelty of the Caribs of the Lesser Antilles corresponded to the wild fury of the old viking rovers of Europe, and gave proof of energy and stamina capable of sturdy endurance, and of ripening into a beneficent maturity; while the gentle and friendly Indians of the larger Antilles, without, in reality, any superior moral attributes, but only the characteristics of a weak and passive nature, have melted away like the snows of the past winter, with scarcely a memorial of their existence left. The Caribs are the historic race of the Antilles, and also of the southern continent of America: their chronicles deriving their vitality and endurance, like those of ancient Europe, from the vicissitudes of war. In all their annals they present themselves as an aggressive people; and

though long since extirpated or expelled from their ancient insular possessions, they still appear on the southern mainland as the people of an encroaching area; and the marches of their extending frontier ring with the shouts of border warfare, as fierce and to us not greatly less substantial than the Wendish and Bulgarian warrings of Henry the Fowler, and his German Markgrafs of well-nigh a thousand years ago.

In 1851, Sir Robert Schomburgk communicated to the British Association, the result of recent ethnological researches in St. Domingo. In this the observant traveller deplores the fact that of the millions of natives who at its discovery peopled the island, not a single pure descendant now exists, though he could trace in the Indios of mixed blood the peculiar features and other physical characteristics of the pure Indian still uneradicated. In the absence of a true native population of the island aborigines, Sir Robert Schomburgk remarks: "My researches were restricted to what history and the few and poor monuments have transmitted to us of their customs and manners. Their language lives only in the names of places, trees, and fruits, but all combine in declaring that the people who bestowed these names were identical with the Carib and Arawaak tribes of Guiana. An excursion to the calcareous caverns of Pommier, about ten leagues to the west of the city of Santo Domingo, afforded me the examination of some picture-writings executed by the Indians after the arrival of the Spaniards. These remarkable caves, which are in themselves of high interest, are situated within the district over which, at the landing of the Spaniards, the fair Indian Catalina reigned as cacique." To this district they were tempted by the news of rich mines in its mountains. In 1496, a fortified tower was erected, called originally San Aristobal, but so abundant was the precious metal, that

even the stones of the fortress contained it, and the workmen named it the Golden Tower. But the lives of millions of the miserable natives were sacrificed in recovering the gold from their mountain veins, and then, the mines being exhausted, the country was abandoned to the wild exuberance of tropical desolation, while the caverns which had previously been devoted to religious rites, became places of retreat from the Spaniard and his frightful bloodhound. One of the smaller caves still exhibits a highly interesting series of symbolic pictures, which the Indians had traced with charcoal on the white and smooth walls, from whence it has received the name of the painted chamber. Peter Martyr of Angleria, the contemporary, and one of the earliest historians of the discoveries of Columbus, relates in his first decade of the "Ocean," that the aborigines of Santo Domingo held caves in great veneration, for out of them they said came the sun and moon to give light to the world, and mankind also issued from two caves of unequal height, according to their relative stature. On those caverns Sir R. Schomburgk remarks: "In the general uncertainty which prevails with regard to these monuments of bygone races, it was particularly gratifying to find sculptures which afforded a clue to the period when they were executed. Near the entrance of a second cave close to the former, I observed some carvings on the rock. The character of these figures, and their being cut in the hard substance of stone, prove an origin of a more remote date than those in the other cave. Baron Humboldt observes, when alluding to the carvings he met with on the banks of the Orinoco, that it must not be forgotten that nations of very different descent, when in a similar uncivilized state, having the same disposition to simplify and generalize outlines, and being impelled by inherent mental dispositions to form rhythmical repetitions and

series, may be led to produce similar signs and symbols. But he had only opportunity to view the carved figures on the Orinoco, but the examination of a great number of these symbols shows to me that there is a great difference in their character and execution; nor is it my opinion that the idols worked in stone, and the carvings on the rocks, were executed by the races that inhabited South America and the West Indies at the time of their discovery. They belong to a remoter period, and prove much more skill and patience than the simple figures painted with charcoal on the walls of the cave near Pommier. The figures carved of stone, and worked without iron tools, denote, if not civilisation, a quick conception and an inexhaustible patience to give to these hard substances the desired forms." From his examination of the tools and utensils still in use among the existing tribes in Guiana, Sir Robert doubts such to be the work of the Caribs; but he admits that they are only found where we have sure evidence that the Caribs inhabited or visited the place, and he under-estimates both the skill and patience shown by many native artists equally poorly provided with tools. The carvings of the Polynesians on their elaborately-wrought clubs and paddles, and the complicated designs of the Babeen and Clalam sculptors, are frequently the result of many weeks and even months of labour, desultorily and intermittingly expended, but nevertheless with a persevering aim towards the accomplishment of one premeditated design.

Among various evidences of the former presence of the Caribs in the Santo Domingo, Sir Robert Schomburgk describes his finding, at the eastern point of the island called Junto Engaño, numerous heaps of conch shells (*Strombus gigas*). "These shells have invariably a hole near the spire, which has been made for the purpose of detaching the animal from the shell, to extract it with ease.

I met with a large number of similar piles at the Island of Anegada, which the historians of the Antilles ascribe to the Caribs, who, on their descent from the Lucuyas to wage war upon the natives of Puerto Rico, touched first at Anegada in order to provision themselves with conchs for their expedition." Other relics of native art and history attracted the attention of the traveller, while exploring those islands, and he specially dwells with interest on a paved ring of granite, in the vicinity of San Juan de Maguana, in St. Domingo, which formed, at the time of its first discovery by Europeans, a distinct kingdom, governed by the cacique Caonabo, the most fierce and powerful of the Carib chiefs, and the irreconcilable enemy of the European invaders. The circle consists of granitic rocks, from thirty to forty pounds in weight, and seeming, from their smooth and water-worn look, to have been brought a considerable distance, from the river Maguana. The ring has the appearance of a paved road twenty-one feet in breadth, and about 2270 feet in circumference. A large granitic mass in the centre, fully five and a half feet in length, has been smoothed and rudely fashioned into the shape of a human figure; and corresponds in every respect to another represented by Père Charlevoix, in his *Histoire de l'île Espagnole ou de Saint-Dominique*, which he describes as a figure found in an Indian grave. A pathway, of the same breadth and workmanship as the ring, extends from it due west, and turns afterwards at a right angle to the north, ending at a small brook. It is called at the present day, "El Cercado de los Indios," but Sir Robert Schomburgk questions its being the work of the inhabitants of the island when first visited by the Spaniards, and assigns it, along with figures which he examined cut into rocks in the interior of Guiana, and the sculptured figures of St. Domingo, to a people far superior in intellect to those

Columbus met with in Hispaniola. These he conceives to have come from the northern part of Mexico, adjacent to the ancient district of Huastecas, and to have been conquered and extirpated by their Carib supplanters, prior to European colonists displacing them in their turn. In this opinion, however, perhaps an undue weight is attached to the imperfect appliances of the insular Caribs.

Among the numerous stone weapons or implements which have been discovered, and serve to illustrate the primitive arts of the New World, three remarkable relics from the Bay of Honduras, in South America, are deserving of special attention. They were found, about the

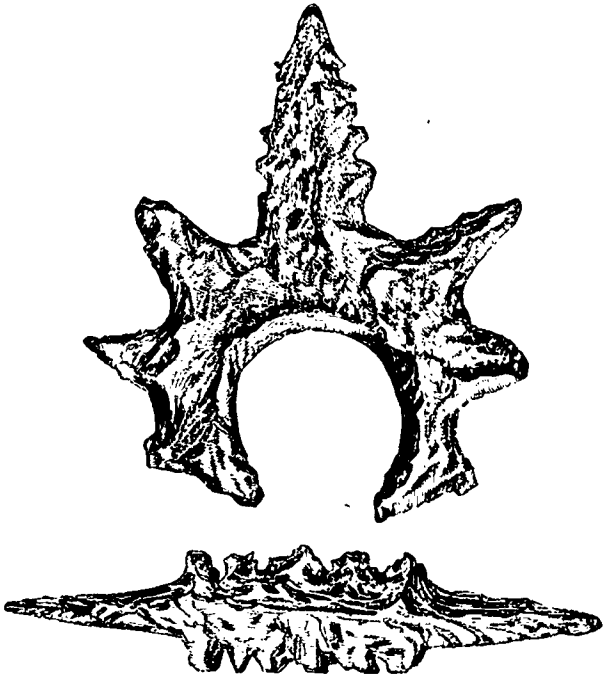


FIG. 7.—Honduras Flint Implements.

year 1794, with other examples, in a cave between two and three miles inland. One of them was presented to the British Museum, and two others have been repeatedly

exhibited at meetings of the Archæological Institute. The accompanying woodcuts will best convey an idea of their peculiar forms. One is a serrated weapon, pointed at both ends, and measuring sixteen and a half inches long. Another is in the form of a crescent, with projecting points. It measures seventeen inches in greatest length, and it is conjectured may have served as a weapon of parade, like the state partisan or halbert of later times. The third, which is imperfect, has probably resembled the previous one in general form. The whole are examples of implements wrought in flint, of unusually large proportions, and chipped with extraordinary regularity and skill. A remarkable specimen of terra-cotta obtained about the same period, and presented to the Society of Antiquaries of Scotland in 1798, is figured on a subsequent page.

FIG. 8.—Honduras Implement.

The island of Jamaica has furnished a peculiarly abundant series of examples of the stone and flint weapons and implements of its ancient inhabitants; and in many of the islands relics of the ingenious conversion of the conch and others of the large shells of the Caribbean Sea, to the purposes of manufacture, have been frequently found. But while thus noting the varied uses to which the gigantic marine shells of the Antilles were applied by the natives of the Archipelago, a still greater interest attaches to the evidences of an ancient trade in the same products of the Gulf of Florida, carried on among the widely-scattered tribes and nations of North America, long before its discovery by Columbus.

Abundant evidence exists to prove that they were

greatly valued, and even regarded with superstitious reverence, both by the more civilized nations of the neighbouring mainland around the Gulf of Florida, and also by the Indian tribes even so far north as beyond the shores of the great Canadian Lakes. In one of the singular migratory scenes of the ancient Mexican paintings, copied in Lord Kingsborough's *Mexican Antiquities*,[1] from the Mendoza Collection, preserved among the Selden MSS. in the Bodleian Library at Oxford, a native figure is represented carrying a large univalve shell in his hand. He is barefooted, and dressed only in a short, spotted tunic, reaching to his loins. In his right hand he bears a spear, toothed round the blade, it may be with inserted flints or points of obsidian, while he holds the large shell in his left hand. A river, which he is passing, is represented by a greenish stripe winding obliquely across the drawing, and his track, as indicated by alternate footprints, has previously crossed the same stream. On this trail he is followed by other figures nearly similarly dressed, but sandalled, and bearing spears and large fans; while a second group approaches the river by a different trail, and in an opposite direction to the shell-bearer. Other details of this curious fragment of pictorial history are less easily interpreted. An altar, or a temple, appears to be represented on one side of the stream; and a highly coloured circular figure, like a shield, on the other, may be the epitomized symbol of some Achæan land or Sacred Elis of the New World. But whatever be adopted as the most trustworthy interpretation of the ancient hieroglyphic painting, its general correspondence with other migratory depictions is undoubted; and it is worthy of note, that, in some respects, the most prominent of all the figures is he who is represented as fording the stream, bearing one of the large tropical univalves in his hand.

[1] *Mexican Antiquities*, vol. i. plate 68.

The evidence which such a remarkable record affords of an importance attached to the large sea-shells of the Gulf of Mexico, among the most civilized of the American nations settled on its shores, is deserving of notice; but the same tropical marine products acquire a new and more important significance when they are met with among relics pertaining to Indian tribes settled in the northern regions of the continent, some of them upwards of three thousand miles distant from the native habitat of the mollusca, by which these coveted treasures of the ocean are produced, and separated by hundreds of miles from the nearest sea-coast.

Tracing them along the northern route through the Mississippi and Ohio valleys, these shells have been found in the ancient graves of Tennessee, Kentucky, and Indiana, and northward to the regions of the Great Lakes. Dr. Gerard Troost, in a communication to the American Ethnological Society,[1] has described a singularly interesting series of ancient relics and sepulchral remains discovered in Tennessee. The crania of the graves were characterized by remarkable artificial compression, as in the example figured by Dr. Morton, plate 55, *Crania Americana.* These ancient graves abounded with relics, "lares, trinkets, and utensils, all of a very rude construction, and all formed of some natural product, none of metal." From an examination of these, Dr. Troost was led to the conclusion that the race to whom they pertained came from some tropical country. Among their stone implements obsidian abounded. Numerous beads were formed of tropical marine shells of the genus *marginella,* ground so as to make a perforation on the back, by means of which they could be strung together for purposes of personal ornament. Plain beads were made from the columellæ of

[1] *Transactions, American Ethnological Society,* vol. i. pp. 355-365.

the *Strombus gigas;* and such columellæ were found worn to a uniform thickness, perforated through the centre, and in all stages of manufacture, from the rude state in which such are found on the island shores of the West Indies, to their condition as perfected beads and links of the much-prized *wampum.* Similar accumulations of shell-beads are of frequent occurrence in the great mounds of the Ohio valley, and are again referred to in a subsequent chapter; but another relic, formed in part also of the gigantic shells of the tropics, presents characteristics of still greater interest as illustrative of ancient manners and modes of thought. Dr. Troost describes and figures various rudely modelled and sculptured idols found in the same locality, from some of which he was led to assume the existence of Phallic rites among the ancient idolaters of the Ohio valley. One of these specimens of aboriginal sacred sculpture was accidentally discovered in ploughing a piece of land newly reclaimed from the forest. The utensils found in the Tennessee graves have all been made of stone or obsidian; and the greater number of the idols are in like manner sculptured in stone of various kinds and degrees of hardness. But the figure now referred to is made of clay and pounded shells, and, like other examples which have been met with, has

FIG. 9.—Tennessee Idol.

been hardened in the fire. It represents a nude human figure, kneeling, with the hands clasped in front; and when found, it still occupied, as its primitive niche or sanctuary, a large tropical shell (*Cassis flammea*), from which the interior whorls and columella had been removed, with the exception of a small portion at the base, cut off flat, so as to form a pedestal for the idol. The special application of this example of the tropical cassides, thus found so remote from its native habitat, adds a peculiar interest to it, as manifestly associated with the religious rites of the ancient race by whom the spoils of southern seas were transported inland, and converted to purposes of ornament and use.

The discovery of examples of similar tropical relics, or of articles of personal ornament fashioned from them, when found to the north of the Great Lakes, is still more calculated to excite surprise, and, when first brought under notice, was made the basis of some very extravagant ethnological theories. Mr. John Delafield, in his *Inquiry into the Origin of the Antiquities of America*, describes two large specimens of the *Pyrula perversa*, and refers to similar examples frequently found in the ancient monumental and sepulchral mounds of Ohio. He then quotes from an essay read by him before the Historical and Philosophical Society of Ohio; but, ignorant of the true habitat of the *Pyrula perversa*, he describes it as unknown on the coasts of North or South America, while it abounds, as he believes, on the coast of Hindustan, and hence he assumes that such relics afford no slight evidence of a migration from southern Asia.[1] This idea, which for a time was entertained with much favour, is now known to be entirely unfounded; but though we have not in such relics the traces of such far wanderings from the old East, the

[1] *Inquiry into the Origin of the Antiquities of America*, p. 162.

chief interest which the large pyrulæ of the Florida Gulf do possess is from the light they are calculated to throw on the traces of ancient migration, or of traffic between the north and south, in ages prior to the displacement of the red man by the European. Two of such large tropical shells, both of them specimens of the *Pyrula perversa*, the native habitats of which are the Antilles and the Bay of Campeachy on the mainland, have been presented to the Canadian Institute at Toronto: not as additions to its specimens of native conchology of the tropics, but as Indian relics pertaining to the great northern chain of fresh-water lakes. The first of these was discovered on opening an Indian grave-mound, at Nottawasaga, on the Georgian Bay, along with a gorget made from the same kind of shell. The second example was brought from the Fishing Islands, near Cape Hurd, on Lake Huron; another, from the Georgian Bay, is in the Museum of the University of Toronto, and many specimens have come under my notice which have been procured from grave-mounds and sepulchral depositories on the shores of the same Bay. In one pit, about seven miles from Penetanguishene, three large conch-shells were found, along with twenty-six copper kettles, a pipe, a copper bracelet, a quantity of shell beads, and numerous other relics. The largest of the shells, a specimen of the *Pyrula spirata*, weighed three pounds and a quarter, and measured fourteen inches in greatest length; but a piece had been cut off this and another of the large shells, probably for the manufacture of some smaller ornament for the person. It exhibited abundant marks of age and frequent handling, its outer surface being quite honeycombed, while the inside retained its smooth lamellated surface. Another sepulchral depository, discovered on elevated ground in the neighbouring township of Oro,

contained twenty-six copper kettles, underneath one of which lay another of the large tropical shells, seemingly carefully packed in beaver skins and bark; while in a third cemetery in the same district, among copper arrow-heads, bracelets, and ear-ornaments, pipes of stone and clay, beads of porcelain, red pipe-stone, etc., sixteen of the same prized tropical univalves lay round the bottom of the pit arranged in groups of three or four together. Numerous skeletons, or detached skulls and bones promiscuously heaped alongside of these relics, attested the sepulchral character of the depository, and the kettles had been rendered useless by the blows of a tomahawk, according to the invariable practice of the Indians with offerings deposited beside their dead. Examples of corresponding discoveries of the tropical shells of the Gulf of Mexico, thus transferred thousands of miles inland, and cherished by the ancient tribes around Lake Huron with superstitious reverence, might be greatly multiplied; but evidence enough has been adduced to prove the frequency of their occurrence, and the value attached to them. From their columellæ the sacred wampum was made, along with gorgets and other special decorations; and the appearance of some of the exhumed shells suggests that they may have been handed down through successive generations as great medicines, before their final deposition among the rare and costly offerings in honour of the dead.

The ingenious manufactures of the islanders of the Caribbean sea, from the large marine shells which abound on the coasts, naturally attract our attention as examples of constructive skill adapting the readiest materials to supply the necessity which man has for tools. But the interest which attaches to such conchological relics as the *Pyrulæ* found in the old grave-mounds and ossuaries of Canada, manifestly depends on the fact of thus dis-

covering, along the shores of the great inland chain of fresh-water lakes, specimens of the large sea-shells of the Atlantic and Pacific coasts of Central America, and of the West Indian Isles. The attractions offered by such large and beautiful tropical shells are sufficiently apparent, and, as we have seen, are by no means limited to the untutored tastes of the American Indian, nor to the products of the Mexican coasts. Their employment in the construction of vessels for ordinary use has already been referred to; but other and more important applications of some of them for special religious services among the inhabitants of the Old World seem to offer illustrations more in accordance with the discoveries here referred to. In India, China, and Siam, the *Pyrum*, and others of the large and beautiful shells of the Indian Ocean, of the species *Turbinella*, are highly prized by the natives of the neighbouring districts; and this is especially the case with a sinistrorsal variety found on the coasts of Tranquebar and Ceylon, and made use of by the Cingalese in some of their most sacred rites. Such reversed shells of the species *Turbinella*, are also held in special veneration in China, where great prices are given for them; and they are often curiously ornamented with elaborate carvings, fine specimens of which are in the British Museum. They are kept in the pagodas by the priests, and are not only employed by them on certain special occasions as the sacred vessels from which they administer medicine to the sick, but it is in one of those sinistrorsal turbinellæ that the consecrated oil is kept, with which the Emperor is anointed at his coronation.

While avoiding the error of earlier observers, who fancied they discovered in the pyrulæ of the Ohio grave-mounds the traces of a remote Asiatic migration to the New World: such analogies in the choice of objects of

veneration or superstitious value, as are indicated in the uses to which the pyrulæ of the Indian Ocean and of the Gulf of Florida are applied, are full of interest to the ethnologist. Nor are such analogies confined to the veneration for gigantic tropical shells. Some of the personal ornaments of the modern Hindu, manufactured from the solid porcellaneous pyrum, closely correspond to the relics of similar construction found in ancient American grave-mounds, and supposed by their first discoverers to be wrought in ivory. The chief value of the latter, however, arises from their discovery in latitudes altogether remote from the native habitat of the living mollusc, and the consequent traces which they disclose of ancient migration, or of traffic between widely separated tribes. But while the tropical shells thus met with in the regions of the Great Lakes may be assumed to represent one among the treasures of southern latitudes: the north had its coveted mineral wealth, of the diffusion of which throughout the whole tribes of the northern continent we have abundant evidence from various sources, and referring to very different periods. Among the relics entombed in the sacrificial mounds of the Mississippi valley have been found objects formed from the mica of the Alleghanies, and the native copper of Lake Superior, mingling with others made of the obsidian of Mexico, or modelled from tropical fauna of the southern continent.

Traces of ancient migration, and of a widely-extended traffic, reveal themselves in records derived from very diverse sources, and indicate extensive wanderings of the aboriginal American tribes and nations, while still practising the primitive arts of the American stone-period. In the *League of the Iroquois*, an interesting contribution to American ethnology and history, written by Mr. Lewis H. Morgan, from materials gathered in co-

operation with Hasanoanda, an educated Seneca Indian, the author observes: "Earthen pots are frequently found beside the remains of the Iroquois. In these it was customary to deposit food for the departed while journeying to the realm of the Great Spirit. These earthen dishes are still found in Indian burial-places, where perhaps they had lain for centuries, and the fragments of those which have been broken by the plough are also mingled with the soil. Metallic implements were unknown among them. Rude knives of chert were used for skinning deer, and similar purposes; for cutting trees, and excavating canoes and corn mortars; in a word, for those necessary purposes for which the axe would seem to be indispensable, the Iroquois used the stone chisel. In cutting trees fire was applied at the foot, and the chisel used to clear away the coal. By a repetition of the process trees were felled and cut to pieces. Wooden vessels were hollowed out by the same means. Stone gouges in the form of a convex chisel, were also used when a more regular concavity of the vessel was desired. Stone mortars for pounding corn, grinding mineral paint, and for pulverizing roots and barks for medicines, were also among their utensils. Arrow-heads of flint were so common that it is scarcely necessary to refer to them. Occasionally they are found with a twist to make the arrow revolve in its flight. It is well known that the Indian always feathered his arrow for the same purpose. It is not uncommon to find the places where these arrow-heads were manufactured, which are indicated by the fragments of chert made by cleavage." The *osquesont*, or stone tomahawk, is also described as the ancient weapon of the Iroquois, while various other equally primitive implements, utensils, and personal ornaments, very ingeniously wrought, were in use among the same people.

For all the purposes of ethnological and historical investigation, the Indians of the Iroquois confederacy are indeed a singularly interesting people. Their own native chronicler, while unfailing in his efforts to set forth in amplest form every evidence of their superiority over all the northern tribes, acknowledges that metallic weapons were unknown among them, and that they had no use of metals. The traditions of the Aztecs at the time of the Mexican conquest, pointed to their origin from among the warlike and migratory Indian tribes of the North-west; and here, at the period of early European contact with the tribes of the North-east, we find an Indian nation in the most primitive condition as to all knowledge of progressive arts, but full of energy, vitality, and military enterprise, and amply endued with the qualities requisite for effecting permanent conquests over a civilized but unwarlike people. Nor did the primitive arts of the Iroquois prevent the development of many incipient germs of civilisation among them. Agriculture was practised systematically, and to a considerable extent; and their famous league, wisely established, and maintained unbroken through very diversified periods of their history, exhibits to us a people advancing in many ways towards the full initiation of a self-originated civilisation, when the intrusion of Europeans abruptly arrested its progress, and brought them in contact with the elements of a foreign civilisation pregnant only with the sources of their degradation and final destruction.

The historian of the Iroquois, when describing their simple arts and manufactures, remarks, that in the western mounds rows of arrow-heads or flint-blades have been found lying side by side, like teeth, the row being about two feet long. "This has suggested the idea that they were set in a frame, and fastened with thongs, thus

making a species of sword." In this description we cannot fail to recognise the sword of Mexico and Yucatan. In the large canoe with its armed crew, first met off that coast, Herrera tells us the Indians had "swords made of wood, having a gutter in the forepart, in which were sharped-edged flints strongly fixed with a sort of bitumen and thread." Among the Mexicans this toothed blade was armed with the *itzli*, or obsidian, capable of taking an edge like a razor; and the destructive powers of this formidable weapon are frequently dwelt upon by the early Spaniards. Among the ruins of Kabah, in Yucatan, the attention of Stephens was attracted by the protruding corner of a sculptured plume of feathers, which led to his laboriously excavating a large sculptured slab, the basso-relievos on which consist of an upright figure having a lofty plume of feathers falling to his heels, while before him kneels another figure holding in his hands the very same weapon, with its flint or obsidian blades projecting from the wooden socket. The idea it suggests is not necessarily that assumed by Stephens, viz., that the sculptors and architects of the great ruins of Central America and Yucatan were the same people whom the Spaniards found there on their landing. The sculptured slab may be of a greatly older date. On its lower compartment is a row of hieroglyphics; and the suppliant attitude of the armed figure is rather suggestive of a record of conquest over some barbarian chief of the Mexican or more northern tribes, of whom the flint-edged sword-blade may have been regarded as the most typical characteristic. Nevertheless, there is a singular interest in the simple chain of evidence, thus confirmatory as it seems of the ancient Aztec traditions of original migration, which leads us, step by step, from the rude arts of the Iroquois, and the relics of the western sepulchral mounds, to the armature of the Mexi-

cans of the era of the conquest, and the artistic records of the lettered architects of Yucatan.

The history of the Iroquois, and of the varied applications of their simple arts, illustrates with peculiar aptness the unwritten chronicles of the New World. The Indians of the Iroquois, while in that primitive condition, achieved a more remarkable civil and military organization, and acquired a more extensive and enduring influence, than any other nation of native American lineage, excepting the civilized Mexicans and Peruvians. Their own traditions pointed to a remote era, when they migrated from the northern shores of the St. Lawrence into that region to the south and east of Lake Ontario, where they dwelt through all the period of their authentic history; though it must also be noted that the Senecas and Onondagas, two of the members of the league, claimed to be autochthones, sprung from the soil of that Iroquois territory. The league embraced the closely-allied nations of the Oneidas, Onondagas, Cayugas, Senecas, and Mohawks, all united in a strictly federal union; and to this the Tuscaroras were admitted, on their expulsion from North Carolina in 1715. The claim of a common origin advanced by a people occupying territory so far to the south, throws an interesting light on the migrations of the Indian tribes. It is confirmed by the character of their language, and received practical recognition in the assignment of a portion of the Oneida territory for their occupation. In the seventeenth century the Iroquois were the great aggressive nationality of the continent, to the north of Mexico. In the very beginning of that century, Captain John Smith, the founder of Virginia, encountered their canoes on the upper part of the Chesapeake Bay, bearing a band of them to the territories of the Powhattan confederacy.

The Shawnees, Susquehannocks, Nanticokes, Miamis, Delawares, and Minsi, were, one after another, reduced by them to the condition of dependent tribes. Even the Canarse or Long-Island Indians found no protection from them in their sea-girt home beyond the Hudson; and their power was felt from the St. Lawrence to Tennessee, and from the Atlantic to the Mississippi.

How long before the discovery of this vast region by Europeans, it had been in occupation by those who claimed to be its autochthones, we have no other knowledge than their own traditions of migration. But so far as arts are any evidence of national progress, they were then in their infancy. Nevertheless, for nearly two centuries, the Indians of the Five Nations, as they were called before the addition of the Tuscaroras, presented a sturdy and unbroken front to European encroachment, alike by Dutch, French, and British colonists. But their uncompromising hostility was concentrated in opposition to the French nation; and as the rival colonies of France and England were long nearly balanced, it is not unjustly affirmed by the historian of the Iroquois, that to their league France chiefly owes the final overthrow of her magnificent schemes of colonization in North America.

Such are some of the glimpses which the history of the New World thus affords us, of what man is capable of achieving through long centuries, independent of all the arts and appliances of civilisation, which to us seem almost indispensable to our very existence. But whatever time might have developed out of the Iroquois confederacy, akin to the native civilisation which had already taken root beyond the verge of their most southern conquests, in their barbarian condition they had little to hope from the triumph of either of the

European aggressors between whom they so long held the balance. The insular European race proved the victors; and when at a later date England and her American colonies came into collision, the nations of the League took different sides, and the Hodenosaûnee finally ceased to be the symbol or ideal rallying-point of a united people. They had run their destined course; and now the poor scattered remnants of the once-famous Indian federal league, serve only to illustrate how irreconcilable are the elements of a highly developed civilisation with the most vigorous and progressive energy of a people only maturing the earliest stages in the progress of nations towards social, moral, and intellectual elevation. Stone, bronze, and iron periods, are not indispensable links in the progress of the human race; but all experience serves to prove that when such social conditions are abruptly brought into contact, as the stone and iron periods most aptly symbolize, the invariable tendency is towards the degradation and final extinction of the less advanced race. It is a law of wide application. The serf of Poland and Russia is now in the condition of the Saxon unfree long prior to the Conquest. It may well be doubted if it either ameliorates his present condition, or accelerates his healthful progress, that he has to work out his elevation alongside of the advanced nationalities of Europe's nineteenth century. France, amid all her æsthetic civilisation, is, in point of political progress, scarcely in advance of the England of the seventeenth century; and more than one false step in her past history is traceable to her effort to assume the greater maturity of England without passing through England's preliminary training. But whatever truth there may be in such applications of the law which seems to control

the influence of nations brought into contact in diverse stages of progress, the evidences are manifold which prove that the most powerful savage nations, when forced into contact with the elements of a highly-matured civilisation, perish hopelessly, like an untimely birth; or as the stars fade and disappear before the brightness of the sun.

CHAPTER VIII.

THE METALLURGIC ARTS—COPPER.

THE dawn of America's metallurgic era is marked by certain specialities which trace their origin to physical causes pertaining to the different regions in which it had its rise. These regions are widely separated, and to all appearance, totally independent of each other. They illustrate two distinct phases of incipient civilisation, each presenting many peculiarities calculated to throw new light on the prehistoric chroniclings of the Old World, as well as to furnish glimpses of America's unwritten history. To man in the primitive condition of rude arts pertaining to his stone-period, the facilities presented by the great copper regions of Lake Superior, for the first transitional steps towards that knowledge of metallurgic arts which in itself is power, were peculiarly accessible. The forests that spread their shadows along the shores of the great lake were the haunts of the deer, the beaver, the bear, and other favourite objects of the chase; the rivers and the lake abounded with fish; and the rude hunter had to manufacture his weapons and implements out of such materials as nature placed within his reach. The water-worn stone from the beach, patiently ground to an edge, made his axe and tomahawk; by means of which, with the ever-ready service of fire, he could level the giants of the forest, or detach from them the materials for his canoe and paddle, his

lance, club, or bow and arrows. The bones of the deer pointed his lance, or were wrought into his fish-hooks; and the shale or flint was chipped and ground into his arrow-head, after a pattern which the tool-making instinct of man seems to repeat with little variation, in all countries, and in every primitive age. But besides such materials of universal occurrence, the primeval occupant of the shores of Lake Superior found there a *stone* possessed of some very peculiar virtues. It could not only be wrought to an edge or point without liability to fracture; but it was malleable, and could be hammered out into many new and convenient shapes. This was the copper, found in connexion with the trappean rocks of Lake Superior, in inexhaustible quantities, and in a pure metallic state. In other rich mineral regions, as in those of Cornwall and Devon, the principal source of the copper is from ores, which require both labour and skill to fit them for economic purposes; but in the veins of the copper region of Lake Superior the native metal occurs in enormous masses, weighing hundreds of tons; and many loose blocks of considerable size have been found on the lake shore, or lying detached on the surface; besides smaller pieces, exposed or mingled with the superficial soil, in sufficient quantities to supply all the wants of the nomade hunter. This, accordingly, he wrought into chisels and axes, armlets, and personal ornaments of various kinds, without the use of the crucible, or any knowledge of metallurgic arts; and, indeed, without recognising any precise distinction between the copper which he mechanically separated from the mass, and the unmalleable stone or flint out of which he had been accustomed to fashion his spear and arrow-heads.

Our earliest glimpses of Britain pertain exclusively to those regions whither the fleets of Tyre were wont to

voyage in quest of the metallic ores which they conveyed to that emporium of the ancient world; and not a little of her later prosperity, and of her greatness among the nations, has been due to the same inexhaustible mineral wealth. To that region, therefore, we have to turn for the earliest chapters of Britain's story; and in the copper regions of the New World are also some curious records of an ancient and long-forgotten past. Having visited and partially explored the ancient mineral regions of Lake Superior, some notes of its characteristic features and general aspects will not be out of place here. Some idea of the present appearance and condition of the region is indeed indispensable for preparing the reader to appreciate the changes wrought by time on localities which are now being rescued once more from the wilderness, but where, more perhaps than on any other spot on the American continent, may be witnessed the incipient traces of metallurgic arts and the dawn of an aboriginal civilisation. The vast inland fresh-water sea, which constitutes the head reservoir of the great chain of lakes that sweep over the falls of Niagara, and find their way to the ocean by the river St. Lawrence, has been as yet so slightly encroached upon by the pioneers of modern civilisation, that its general aspect scarcely differs from that which it presented to the eye of its first European explorers in the seventeenth century, or in all probability to its Indian voyagers at that older epoch before the Spaniard first coasted the island shores of the Bahamas, and opened for Europe the gates of the West. With its wide extent of waters, covering an area of thirty-two thousand square miles, a lengthened period of sojourn in the regions with which it is surrounded, and many facilities for their exploration, would be required, in order to satisfy the curiosity of scientific inquirers in relation to their varied attractions. But even a brief

visit discloses much that is highly interesting, and that serves at once to illustrate, and to contrast with what comes under the observer's notice elsewhere. Having employed both pen and pencil in noting the most striking features which catch the eye from their novelty, a description of the scenery and present aspects of the ancient copper region of Lake Superior will help the reader in some degree to estimate the lapse of time since its dark forest-glades and its rocky promontories were enlivened by the presence of the industrious miners of the centuries before Columbus. The memorials of Time's unceasing operations reach indeed to periods long prior to the earliest presence of man, and present certain lake phenomena, on a scale only conceivable by those who have sailed on the bosom of these fresh-water seas with as boundless a horizon as in mid Atlantic; and who have experienced the violence of the sudden storms to which they are liable. But while the broad ocean-like expanse, and the violence of their stormy moods, alike characterize Ontario, Erie, Michigan, and Huron, it is only on Lake Superior that the traveller witnesses the grandeur and wild ruggedness of scenery commensurate with his preconceived ideas of such great inland seas. Along its northern and western shores bold cliffs and rocky headlands frown in savage grandeur, from amid the unbroken wastes of forest that reach to the frozen regions around the Hudson's Bay, while the gentler coast-lines of its southern shores are varied by some of the most singular conformations, wrought out of its rocky walls by the action of the waves or currents of that magnificent inland sea. Of these, no features are so remarkable as those presented by a portion of the extensive range of sandstone cliffs, which rear their massive fronts and project their jagged and picturesque cliffs from the southern shore, soon after passing the

Grand Sable: the first feature of commanding interest which meets the explorer after leaving the Rapids of Sault Ste. Marie. Here the rounded and slightly undulating shores, with their coast-line of sand and loose shingle, are suddenly changed for a long reach of coast, still rounded in its forms, but rising abruptly in dune-like masses, to a height of upwards of three hundred and fifty feet. At their base the edges of the sandstone strata are occasionally exposed by the action of the waves, but the greater portion of their surface is formed by sand and debris; and the same materials, loosely accumulated on their tops, afford only at rare intervals sufficient soil for the trees, which elsewhere line the whole southern shore of Lake Superior, with that unvarying monotony so familiar to the eye of the American traveller. Beyond the Grand Sable, the coast trends rapidly to the southward, until it reaches the most southerly point of the lake, in the beautiful and sheltered harbour behind Grande Island. In some respects this resembles the magnificent natural harbour in the Clyde, formed by the sheltering barrier of Holy Island and the bold coast of the Isle of Arran; though in the solitude of its embayed waters it presents a striking contrast to Lamlash Bay, towards which the merchant fleets of the Clyde, and of the whole Irish Channel, may be seen crowding all canvas, to escape the dangers of a westerly gale. In approaching this fine natural harbour from the east, the coast presents, for upwards of ten miles, a range of rocky cliffs of varying character and elevation, but rising in some places to a height of fully two hundred feet; and it is on a portion of this range that the French voyageurs, from one of its peculiar features, conferred the name "Les Portails," while they are more generally known to the American traveller by that of "the Pictured Rocks." The latter term is somewhat of a mis-

nomer, as it is usually applied to rocks decorated with the graven picturings of native artists, whereas the paintings of "the pictured rocks" have been pencilled alone by the hand of Nature, which also has hewn them out into their still more remarkable forms. But a fresh and wider interest has been given to the remarkable scene by the introduction of a poetical version of its native legends into Longfellow's Indian *Song of Hiawatha*, where in his hunting of the Storm Fool, Pau-Puk-Keewis fleeing from Hiawatha—

"Sped away in gust and whirlwind,
On the shores of Gitche Gumee,
Westward by the Big-Sea-Water,
Came unto the rocky headlands,
To the Pictured Rocks of Sandstone
Looking over lake and landscape.
And the Manito of mountains
Opened wide his rocky doorways,
Opened wide his deep abysses,
Giving Pau-Puk-Keewis shelter
In his caverns dark and dreary.

. . . . .

Then he raised his hands to heaven,
Called imploring on the tempest,
Called Waywassimo, the lightning,
And the thunder, Annemeekee;
And they came, with night and darkness,
Sweeping down the Big-Sea-Water,
From the distant Thunder Mountains;
And the trembling Pau-Puk-Keewis
Heard the footsteps of the thunder,
Saw the red eyes of the lightning.
And Waywassimo, the lightning,
Smote the doorways of the caverns,
With his war-club smote the doorways,
Smote the jutting crags of sandstone;
And the thunder, Annemeekee,
Shouted down into the caverns,
Saying, 'Where is Pau-Puk-Keewis!'"

It is something altogether novel to have the spirit of its own national poetry thus associated with scenes of the New World, and breathing over them a living soul

akin to that which haunts with such thrilling memories the cave of Staffa and the rocky shores of Iona. The striking, and in some cases, singularly beautiful forms which beguiled the Indian imagination into such wildly fanciful legends, have been hewn out of the sandstone cliffs by the prolonged action of the waves and winds, sweeping from "the distant Thunder Mountains" of the far North through unrecorded centuries, and exhibit all the fantastic and picturesque variety which is so characteristic of the wave-wrought sculpturings of Nature's architecture.

The Pictured Rocks lie at the eastern end of the lake, on its southern shore, and are thus placed between the copper regions and the ancient portage, which has been recently superseded by a canal, opening navigation for the largest vessels from Lake Huron to Lake Superior. An interesting indication, however, points to the ancient native centres of population as having lain to the west. The Indian name of the cliffs is *Schkuearchibi-kung,* or "the end of the rocks," manifestly implying their being observed and named by voyagers from the western regions, when sailing eastward towards the Sault Ste. Marie rapids and the lower lakes. Exploring their picturesque details in this direction, the voyager on sailing inside Grande Island, towards the shore, gradually approaches a range of cliffs, banded in layers of white, yellow, red, and deep-brown strata; and streaked with strongly-marked veins of perpendicular colouring, occasioned by water oozing through the seams, impregnated with metallic oxides, and distributing them over the broad bands of yellow sandstone which constitute the main mass, and lie between the thin layers of coloured rock or shale. In describing one magnificent segmental curve of the cliffs, to which, from its lofty and regular proportions, Messrs. Foster and Whitney, in their "Report on the Geology of

Lake Superior," have given the name of "The Amphitheatre," they remark: "It is in this portion of the series that the phenomena of colours are most beautifully and conspicuously displayed. These do not by any means cover the whole surface, but are confined to certain portions of the cliffs in the vicinity of the Amphitheatre; the great mass of the surface presenting the natural light-yellow, or raw-sienna of the rock. The colours are also limited in their vertical range, rarely extending more than thirty or forty feet above the water, or a quarter, or a third of the vertical height of the cliff. The prevailing tints consist of deep-brown, yellow and grey: burnt-sienna and French grey predominating. There are also bright blues and greens, though less frequent. All of the tints are fresh, brilliant, and distinct, and harmonize admirably with one another; which, taken in connexion with the grandeur of the arched and caverned surfaces on which they are laid, and the deep and pure green of the water which heaves and swells at the base, and the rich foliage which waves above, produce an effect truly wonderful." Many portions of the cliffs are indented by wedge-shaped recesses, which leave the intervening rock projecting like the wasted round towers or bastions of an ancient castle, while the loose soil and shale at top, yielding more freely to the action of the atmosphere, and of moisture and frost, have most frequently assumed the form of a conical roofing, greatly adding to the artificial look of the whole. In one group, especially, a little to the west of the magnificent natural arch styled "Le Grand Portail," the illusion was for the time complete, which suggested to the fancy one of the ancient ruins of Roman masonry still to be seen in the south of England, where the tiers of chalk or stone are banded by occasional layers of the flat-tile Roman brick.

The cliffs are hollowed, arched, and perforated into

caverns, evidently by the action of the waters when at much higher, and varying relative levels. Two groups of these, designated respectively the "Chapel" and the "Miner's Castle," have been excavated into aisles, arched recesses, and columns, so as to rival the most picturesque ruins of the castled Rhine; while overhead the foliage of the uncleared forest crests their summits, and at one spot near the Chapel Rock, a beautiful cascade dashes in white foam over the cliffs into the lake.

> "The rolling stream, the precipice's gloom,
> The forest's growth, and Gothic walls between,
> The wild rocks shaped as they had turrets been
> In mockery of man's art."[1]

This remarkable range of rocks lies in the centre of the long indentation, which, sweeping from Keweenaw Bay eastward to White Fish Point, forms the bay behind Grande Island, the coast most distant from the northern shores of the lake. Here the cliffs have been exposed through unnumbered ages to the action of the northerly winds, which have materially affected the characters of the northern and southern shores of the lake; while the process of upheaval, prolonged probably through vast periods of time, has contributed no unimportant share in the operations by which their present forms have been produced.

Beyond the Grande Island the voyager who pursues his course up the lake, comes once more on rocky cliffs in the vicinity of Marquette: so named after the Jesuit missionary by whom the upper waters of the Mississippi were reached in 1673. Important changes have been wrought in the interval since the Jesuit father wandered into the wild west on his adventurous mission. Mineral treasures, undreamt of by the ancient miners of Lake Superior, are now rewarding the industry of the Indians'

[1] *Childe Harold*, canto iii. s. lxi.

supplanters. The iron-period, with its fully developed civilisation, is at length invading those western forest tracks; and when I visited Marquette in 1855, on the bold trappean rocks which form the landing, abraded and scratched with the glacial action of a long superseded era, were piled the rich products of the "Jackson Iron Mountain," which rears its bold outline at a distance of twelve miles from the shore. Immediately to the north of this point the bold promontory of Presque Isle attracts attention from its rocky outlines, presenting in some respects a striking contrast to the Pictured Rocks, though, like them, also indented and hollowed out into detached masses, and pierced with the wave-worn caverns of older levels of shore and lake. Here the water-worn sandstone and the igneous rocks overlie or intermingle with each other, in picturesque confusion; the symbol as it were of the great transition between the copper and iron eras. For it is just at Presque Isle that the crystalline schists, with their intermingling masses of trappean and quartz rocks, richly impregnated with the specular and magnetic oxide of iron, pass into the granite and sandstone rocks, which intervene between the ferriferous formations and the copper-bearing traps of Keweenaw Point; and it is of this very locality that the authors of the report on the geology of the district remark: "It would be difficult to select another spot along the whole coast, where the rocks of so many epochs, from the oldest to the most recent, are represented. It contains an epitome of nearly the whole geology of the district." Beyond this, the rich copper-bearing region of the Keweenaw Peninsula stretches far into the lake, traversed in a south-westerly direction by magnificent cliffs of trappean rocks, presenting their lofty perpendicular sides to the south-east, and covered even amid the rocky debris with ancient forest-trees. In this igneous rock are found the

copper veins, which in recent years have conferred such great commercial value on the district of Michigan, to which they belong. Having had opportunities of exploring some of the richest mineral districts of Lake Superior, and traversing its wild natural forests and steep rocky tracts: I have felt, while surrounded by the gloom of the savage wilderness, how difficult it is to realize the conception that these copper-bearing regions were ever before ransacked for their mineral treasures, or explored by any other but the stray Indian hunter, until the commencement of regular mining operations in very recent years. Yet there I had the opportunity not only of witnessing the extensive mining operations now in progress, but of examining for myself evidences of the ancient miner's labours, which prove the existence, at some remote period, of the rudiments of native metallurgic arts.

On landing at Eagle river, one of the points for shipping the copper ores, on the west side of the Keweenaw Peninsula, the track lies through dense forest, over a road in some parts of rough corduroy, and in others traversing the forest in its gradual ascent over the irregular exposed surface of the copper-bearing trap. After a time it winds through a gorge, covered with immense masses of trap and crumbling debris, amid which pine, and the black oak and other hard wood, have contrived to find a sufficient soil for taking root and growing to their full proportions; while here and there the eye lights upon some giant pine overthrown by the wind, and turning up its great roots which grasp the severed masses of rounded trap in their convolutions, like gravel clutched from the ocean's bed in the hands of a drowned seaman. On the summit of the ridge, the trap rock rises into a range of cliffs, which, judging by the eye, I should suppose cannot be less than two hundred feet high, and in front of them is a sloping tail, the accumulated debris of ages, bearing

a close resemblance to Salisbury Crag, excepting that it is partially wooded, and the trees have in some places attained to an immense size, notwithstanding the apparent poverty of the rocky soil.

In traversing this route the road lies in part along the banks of the Eagle river, where, some miles from its mouth, a detour has to be made to avoid a beaver dam, flooding a part of the river banks by means of the ingenious structure. No traces, however, give the slightest indication to the passing traveller that the hand of man had ever wrought any changes on the aspect of a region characterized by features so singularly wild and desolate-looking. Beyond the cliffs, in a level bottom on the other side of the trap ridge, is the Cliff Mine settlement, one of the most important of all the mining works in operation in this region.

I descended the perpendicular shaft by means of ladders, to a depth of sixty fathoms, and explored various of the levels; passing in some cases literally through tunnels made in the solid copper. The very richness and abundance of the metal proves indeed a cause of diminution of the profits arising from working it. I witnessed the laborious process of chiselling out masses from the solid lump, of a size sufficiently small to admit of their being taken to the surface, and transported through such tracts as have been described, to the shores of Lake Superior. The floor of the level was strewed with the copper shavings struck off in the effort to detach them, and the extreme ductility of the pure native copper was pointed out as a cause which precluded the application of any other force than that of slow and persevering manual labour, for separating it from the parent mass. I saw also beautiful specimens of silver, in a matrix of crystalline quartz, obtained from this mine, and the copper of the district is stated to contain on an

average about 3·10 per cent. of silver. One mass of copper quarried from the Cliff Mine has been estimated to weigh eighty tons. It was sufficiently detached from its rocky matrix, without injuring its original formation, to admit of its dimensions being obtained with considerable accuracy, and it was found to measure fifty feet long, six feet deep, with an average of about six inches in thickness. This is indeed by far the richest mineral locality that has yet been wrought. In one year upwards of sixteen hundred tons of copper have been procured from the single mine. Its mineral wealth appears to have been known to the ancients, from the traces of their work which have been discovered; but the skill and appliances of the modern miner give him access to veins entirely beyond the reach of the primitive metallurgist, who knew of no harder material for his tools than the ductile metal he was in search of, and to whom the agency of gunpowder was unknown.

At the Cliff Mine are preserved some curious specimens of ancient copper tools of the native metallurgists, found in its vicinity, but it is to the westward of the Keweenaw Peninsula that the most remarkable and extensive traces of the aboriginal miners' operations are seen. The copper-bearing trap rock, after crossing the Keweenaw Lake, is traced onward in a south-westerly direction till it crosses the Ontonagon river about twelve miles from its mouth; and at an elevation of upwards of three hundred feet above the lake. At this place the edges of the copper veins appear to crop out in various places, exposing the metal in irregular patches over a considerable extent of country. Here, in the neighbourhood of the Minnesota Mine, the richest of all the modern works in the district of Ontonagon, are traces of ancient mining operations, consisting of extensive trenches, which prove that the works must have been carried on

for a long period and by considerable numbers. These excavations are partially filled up, and so overgrown during the long interval between their first excavation and their observation by recent explorers, that they would scarcely attract the attention of a traveller unprepared to find such evidences of former industry and art. Nevertheless some of them measure from eighteen to thirty feet in depth, and in one of them a detached mass of native copper, weighing upwards of six tons, was found resting on an artificial cradle of black oak, partially preserved by immersion in the water with which the trenches had been filled in the first long era after their abandonment. Various implements and tools of the same metal also lay in the deserted trench, where this huge mass had been separated from its rocky matrix, and elevated on the oaken frame, preparatory to its removal entire. It appeared to have been raised about five feet, and then abandoned, abruptly as it would seem, since even the copper tools were found among the accumulated soil by which it had been anew covered up. The solid mass measured ten feet long, three feet wide, and nearly two feet thick; every projecting piece had been removed, so that the exposed surface was left perfectly smooth, possibly by other and ruder workers of a date subsequent to the desertion of the mining trench by its original explorers.

Mr. Charles Whittlesey, who has enjoyed considerable opportunities of personal observation in the copper region, discusses, in the *Cleveland Annals of Science*, various questions connected with the ancient mines, and remarks in reference to the wood-work found in the old Minnesota trench: "I had a piece of one of these logs which was cut from a black oak-tree about six inches in diameter, showing distinctly the marks of a narrow axe 1¾ inches wide, and very sharp. The character of the

cut or stroke made by the axe, struck me at once as such as the copper axes would make that I had seen in Ohio, which were taken from the mounds. Although the timber beneath the mass of copper was very soft and tender, by reason of its age, it had not rotted from exposure, having been always covered by water." The marks of the instrument by which it had been cut, he adds, were as plain as on the recently hewn stumps in the vicinity. Messrs. Whitney and Foster remark on specimens acquired by them from the same ancient excavations: "This wood, by so long exposure to moisture, is dark-coloured, and has lost all its consistency. A knife-blade may be thrust into it as easily as into a peat-bog."

It was in the year 1847 that attention was first directed to such traces of ancient mining operations, by the intelligent agent of the Minnesota Mining Company. Following up the indications of a continuous depression in the soil, he came at length to a cavern where he found several porcupines had fixed their quarters for hybernation; but detecting evidences of artificial excavation, he proceeded to clear out the accumulated soil, and not only exposed to view a vein of copper, but found in the rubbish numerous stone mauls and hammers of the ancient workmen. Subsequent observation brought to light ancient excavations of great extent, frequently from twenty-five to thirty feet deep, and scattered over an area of several miles. The rubbish taken from these is piled up in mounds alongside; while the trenches have been gradually refilled with the soil and decaying vegetable-matter gathered through the long centuries since their desertion; and over all, the giants of the forest have grown, and withered, and fallen to decay. Mr. Knapp, the agent of the Minnesota Company, counted 395 annular rings on a hemlock tree, which grew on one

of the mounds of earth thrown out of an ancient mine. Mr. Foster also notes the great size and age of a pine-stump which must have grown, flourished, and died since the works were deserted; and Mr. C. Whittlesey not only refers to living trees now flourishing in the gathered soil of the abandoned trenches, upwards of three hundred years old; but he adds: "on the same spot there are the decayed trunks of a preceding generation or generations of trees that have arrived at maturity and fallen down from old age." According to the same writer, in a communication made to the American Association, at the Montreal Meeting, in 1857, these ancient works extend over a track from 100 to 150 miles in length, along the southern shore of the lake; and Sir William Logan reports others observed by him on the summit of a ridge at Maimanse, on the north shore, where the old excavations are surrounded by broken pieces of vein-stone, along with which are frequently found the stone mauls, rudely formed from natural boulders. The extensive area over which such works have thus already been traced, the evidences of their prolonged working, and of their still longer abandonment, all combine to force upon the mind convictions of their remote antiquity.

At Ontonagon river I met with Captain Peck, a settler whose long residence in the country has afforded him many opportunities of noting the evidences of its ancient occupation. Repeated discoveries had led him to infer the great antiquity of the works; and he specially referred to one disclosure of ancient mining operations near the forks of the Ontonagon river, where, at a depth of upwards of twenty-five feet, stone mauls and other tools were found in contact with a copper vein; in the soil above these lay the fallen trunk of a large cedar, and over all grew a hemlock-tree, the roots of

which spread entirely above the fallen tree in the accumulated soil with which the trench was filled, and indicated in his estimation a growth of not less than three centuries. This assumed age nearly corresponds to the actual number of annual rings exposed in the sections of other trees felled in the same locality. But the buried cedar, which in favourable circumstances is far more durable than the oak, represents another and longer succession of centuries, subsequent to that protracted period during which the deserted trench was slowly filled up with accumulations of many winters. Similar traces extend over a large area. Not only throughout the Keweenaw Peninsula, and to the westward and southward of Ontonagon, but also on Isle Royale, off the north-west shore of the lake, ancient works have been found with like evidence of their great antiquity. The United States Geologists remark, in their Reports on the Geology of Lake Superior: "Mr. E. G. Shaw pointed out to us similar evidences of mining on Isle Royale, which can be traced lengthways for the distance of a mile. On opening one of these pits, which had become filled up, he found the mine had been worked through the solid rock, to the depth of nine feet, the walls being perfectly smooth. At the bottom he found a vein of native copper eighteen inches thick, including a sheet of pure copper lying against the foot-wall. The workings appear to have been effected simply by stone hammers and wedges, specimens of which were found in great abundance at the bottom of the pits. He found no metallic implements of any description, and is convinced, from the appearance of the wall-rocks, the substances removed, and the multitude of hammers found, that the labour of excavating the rock must have been performed only with the instruments above named, with the aid, perhaps, of fire. From the

appearance of the vein and the extent of the workings, he conjectures that an immense amount of labour had been expended. He endeavoured to find some evidences of the antiquity of these workings, but could discover nothing very satisfactory to his own mind, except that they were made at a remote epoch. The vegetable matter had accumulated and filled up the entire opening to a level with the surrounding surface; and in a region where it accumulates as slowly as it does on the barren and rocky parts of Isle Royale, this filling up would have been the work of centuries. Upon this vegetable accumulation he found trees growing equal in size to any in the vicinity."

The extent of the works on Isle Royale, and the great distance of the locality from the mining region on the southern mainland, add important proofs of the numerous workmen that must once have enlivened the long silent shores of Lake Superior with the sounds and scenes of industrious toil; and confirm by additional evidence the proofs of the great interval which has elapsed since their works were finally abandoned. There, as on the mainland, accumulated soil and subsequent vegetable growth establish unquestionable proofs of a long-protracted, though still uncertain interval, between the close of that prehistoric period and the commencement of the New World's definite annals. On Keweenaw Point the recovery of the ancient miners' tools has, in more than one case, led to the disclosure of valuable lodes of copper. Their abandoned works have been traced over an area of twelve miles in extent, along the base of the trap range already referred to, and have been the first indices to the modern miner of the mineral wealth below. To the southward, in like manner, the attention of explorers has been directed to the long-abandoned trenches. In the section of

country lying in the direction of Agozebec Lake, a surveyor in the employment of the Forest Mining Company discovered a series of ancient works of great extent, excavated along the southern slope of a hill. The bones of the bear, the deer, and the caribou, have been repeatedly found in the soil with which the excavations are filled. In one of the pits the skeleton of a deer rested on a bed of clay, which had been deposited to the depth of a foot above the ancient floor, when it stumbled into the excavation and perished there; and over all, clay, leaves, sand, and gravel, had gradually accumulated to a depth of nineteen feet.

The traces of the ancient miners of Lake Superior have not entirely escaped the notice of Mr. Henry R. Schoolcraft, though he is inclined to undervalue to a remarkable extent the indications they afford that a civilisation of no slight or transitory character once gave life to the forest wilds. Resident as he was for a considerable time in the locality, surrounded alone by the wild Indian hunters, and the Algonquin half-breeds, it is perhaps more difficult for him to realize the idea that such a savage wilderness had ever been otherwise than overshadowed by the primeval forest, than it is for those who have only studied the locality in the narratives of its explorers. My own impressions of its endless tracts of uncleared forests, enlivened as they were by a visit to an encampment of Saultaux Indians in all the simplicity of wild nature, rendered the contrast between its present aspect and the ideas which the traces of its ancient miners suggested, not less startling than those which arise from viewing, amid the scenes of the matured civilisation of Britain, the disclosures of an allophylian cromlech with its primitive weapons and ornaments of stone. Mr. Schoolcraft, however, reposes an undue faith in the evidence of impressions produced by long familiarity with

the modern Indian and his forest haunts; such as, to the sojourner among the wandering Arabs, feeding their flocks above the mounds that diversify the solitude of the great plains of the Euphrates, would have seemed equal proof that since man first trod its ancient soil, it has been known only to the wild desert nomade. "There are," says he, in speaking of the Lake Superior basin, "no artificial mounds, embankments, or barrows in this basin, to denote that the country had been anciently inhabited; and when the inquiry is directed to that part of the continent which extends northward from its northern shores, this primitive character of the face of the country becomes still more striking. It is something to affirm that the Mound-Builders, whose works have filled the West with wonder,—quite unnecessary wonder, —had never extended their sway here. The country appears never to have been fought for, in ancient times, by a semi-civilized or even pseudo-barbaric race. There are but few darts or spear-heads. I have not traced remains of the incipient art of pottery, known to the Algonquin and other American stocks beyond the Straits of Ste. Marie, which connect Lakes Huron and Superior; and am inclined to believe that they do not extend in that longitude beyond the latitude of 36° 30′. There is a fresh magnificence in the ample area of Lake Superior, which appears to gainsay the former existence and exercise by man of any laws of mechanical or industrial power, beyond the canoe-frame and the war-club. And its storm-beaten and castellated rocks, however imposing, give no proofs that the dust of human antiquity, in its artificial phases, has ever rested on them." In this, however, the historian of the Indian tribes is betrayed into an exaggerated depreciation of the memorials of earlier ages, from his disposition to ascribe to the same Red Indian stock every phase of civilized or savage life which

reveals itself in the past history of the American continent.

It will be seen, moreover, that it is an error to affirm that artificial mounds, embankments, or traces of earth-works, suggestive of correspondence with those of the Mound-Builders, are entirely wanting in the copper region. Its ancient memorials have as yet been very partially disclosed; but thus far we derive, from many independent observations, the like confirmation of the indisputable fact that what appear to the eye of the traveller as the giants of the primeval forest, are the growth of comparatively modern centuries, subsequent to the era when the shores of Lake Superior rang with the echoes of industrial toil, wrought by an ancient but long-extinct population. Two or three centuries would seem altogether inadequate to furnish the requisite time for the most partial accumulation of soil and decayed vegetable matter with which the old miners' trenches have been filled, before the forest began to reassert its ancient sway, and clothe in the rich verdure of nature's wildest freshness, their abandoned mines. Four centuries thereafter are indisputably recorded by recent survivors of the forest, independent of all traces of previous arborescent generations; and thus we perceive that in the mining excavations and the tools of the copper regions of Lake Superior, we look on the memorials of a metallurgic industry long prior to those closing years of the fifteenth century, in which the mineral wealth of the New World awoke the Spanish lust for gold. An uncertain, yet considerable period must be assumed to have intervened between the abandonment of those ancient works, and their being restored to the shadows of the wild forest's earliest growth, and thus we are thrown back into dim centuries corresponding to Europe's early mediæval era for a period to which to assign at the very latest

those singularly interesting relics of a lost American civilisation.

Owing to the filling up of the ancient mining trenches with water immediately on their abandonment by their workers, not only the copper and stone implements of the miners are found, but also some examples of wooden tools and timber framing have been preserved, in several cases in wonderful perfection, and these furnish interesting supplementary evidence of the character of their industrial arts.

Of the wooden implements found in the abandoned works, the most noticeable are the shovels, by means of which the soil was excavated and the copper lode laid bare. The accompanying woodcut represents two of

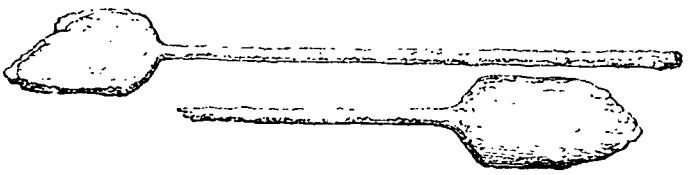


FIG. 10.—Miners' Shovels.

these. They bear some resemblance to an Indian paddle, but are frequently worn sideways, as if used for scraping rather than digging the soil. One, of which Mr. Whittlesey gives a drawing, measured three and a half feet long, and was taken from the loose materials thrown out from an extensive rock excavation in the side of a hill about four miles south-east of Eagle Harbour. Part of a wooden bowl used for baling water, and troughs of cedar-bark, were also found in the same débris, above which grew a birch about two feet in diameter, with its lower roots scarcely reaching through the ancient rubbish to the depth at which those relics lay. Mr. Foster describes another wooden bowl found at a depth of ten feet, in clearing out some ancient workings opened by the agent of the Forest mine, and which from the splintered pieces

of rock and gravel embedded in its rim, must have been employed in baling water. Similar implements have been found in other workings, but they speedily perish on being exposed to the air. All of them appear to have been made of white cedar, the indestructible nature of which, when kept under water, or in a moist soil, is abundantly illustrated by the experience of settlers who have attempted to clear and cultivate a cedar swamp, and have discovered that the dead trunks, exhumed undecayed after centuries of immersion, rest above still older cedar-forests, seemingly unaffected by the process which restores alike the oak and the pine to the vegetable mould of the forest soil.

The process of working the ancient mines seems to be tolerably clearly indicated by the various discoveries made. The soil having been removed by means of the wooden spades, doubtless with the aid of copper tools to break up the solid earth and clay, remains of charcoal met with in numerous instances on the surface of the rock show that fire was an important agent for overcoming the cohesion between the copper and its rocky matrix. Before the introduction of gunpowder, fire was universally employed in excavating rock, and where fuel abounds, as in the old Harz and Altenberg mining districts of Europe, it is even now found to be quite as economical in destroying silicious rocks. The rock having been subjected to this process, stone hammers or mauls were next employed to break it in pieces. These have been found in immense numbers on the different mining sites. Mr. Knapp obtained in one locality upwards of ten cart-loads; and I was shown a well in the neighbourhood of the Ontonagon trenches constructed almost entirely of stone hammers, obtained from ancient workings in the immediate vicinity. Many of these mauls are mere water-worn oblong boulders of

greenstone or porphyry, roughly chipped in the centre, so as to admit of their being secured by a withe around them. But others are well finished, with a single or double groove for attaching the handle by which they were wielded. They weigh from ten to forty pounds. Many are broken, and some of the specimens I saw were worn and fractured from frequent use. Besides these a smaller class of stone chisels or axes are also found, wrought of porphyry, with a groove towards the thicker end, and generally weighing from five to six pounds.

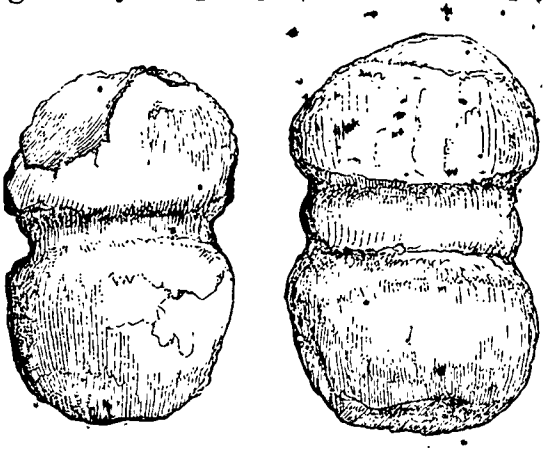


FIG. 11.—Stone Mauls.

But the extent to which co-operation was carried on by the ancient miners with the imperfect means at their command is still further illustrated by a discovery described by Professor Mather, in a letter to Mr. E. G. Squier. On a hill to the south of the Copper Falls mines, one of the abandoned trenches was explored. On removing the accumulations from the excavation, stone axes of large size made of greenstone, and shaped to receive withe handles, and some large round greenstone masses that had apparently been used for battering-rams, were found. "They had round holes bored in them to the depth of several inches, which seemed to

have been designed for wooden plugs to which withe handles might be attached, so that several men could swing them with sufficient force to break the rock and the projecting masses of copper. Some of them were broken, and some of the projecting ends of rock exhibited marks of having been battered in the manner here suggested."[1]

But the industrious miners of the native copper fully appreciated the practical utility of the metal they were in search of; and it is not to be supposed that the old metallurgists employed themselves thus laboriously in mining the copper, and yet used in such operations only stone and wooden tools. Copper axes, gads, chisels, and gouges, as well as knives and spear-heads, of considerable diversity of form, have been repeatedly brought to light, all of them wrought from the virgin copper by means of the hammer, without smelting, alloy, or the use of fire. At the Biglow House at Ontonagon, I had an opportunity of examining an interesting collection of copper relics, found a few months before in the neighbourhood. These consisted of copper tools described as spear-heads, one fourteen inches, and the others about twelve inches in length; and two singularly shaped copper gouges about fourteen inches long and two inches wide, the precise use of which it would be difficult to determine. The whole were discovered buried in a bed of clay on the banks of the river Ontonagon, about a mile above its mouth, during the process of levelling it for the purposes of a brick-field. Above the clay was an alluvial deposit of two feet of sand, and in this, and over the relics of the ancient copper workers, a pine-tree had grown to full maturity. Its gigantic roots gave proof, in the estimation of those who witnessed their removal, of

[1] Squier's *Aboriginal Monuments of the State of New York.* Appendix, p. 184.

more than two centuries' growth; while the present ordinary level of the river is such that it would require a rise of forty feet to make the deposit of sand beneath which they lay.

An experienced practical miner, who had been among the first to open some of the ancient diggings found at the Minnesota mine, stated that the copper gouges seemed to him exactly adapted to produce the singular tool-marks which had then excited his curiosity. Subjoined is a representation of one peculiar type of copper

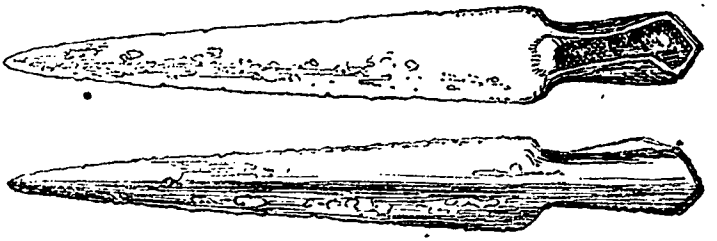


FIG. 12.—Copper Implement.

tools, sketched from the original. It has been repeatedly met with among the relics of the copper region, the blade being three-sided like that of a bayonet. The socket is formed by hammering out the lower part flat, and then turning it over partially at each side. A smaller spear-head found at the Copper Falls mine, measures four and a half inches in length, and had the remains of its wooden handle in it when discovered. This mode of fitting the blade to the haft, especially in the Ontonagon tool, presents a correspondence to some of the more primitive forms of the bronze implements found in Britain and the north of Europe; but the latter are cast of a metallic compound which proves the possession of a skill in metallurgy far in advance of the old workers of the metallic treasures of Ontonagon. In the spear-heads wrought from the native copper of Lake Superior the socket formed by the enclosing flange only

gives additional confirmation to the conclusions suggested by many diverse disclosures, that the ancient miners, as well as the Mound-Builders, were ignorant of the arts of welding and soldering, as well as of smelting the metallic ores.

The details of another, and in some respects more interesting discovery, than that at Ontonagon, were communicated to me in reply to the inquiries made while there. This took place, at a still more recent date, at a locality lying to the east of Keweenaw Point, in the rich iron district of Marquette. There, not far from the mouth of the river Carp, in what appears to have been the ancient bed of the stream, and about ten feet above the present level of its channel, various weapons and implements of copper were recently found. Large trees grew over this deposit also, and the evidences of a remote antiquity seemed not less obvious than in that of Ontonagon. The copper relics included knives, spear or lance heads, and arrow-heads, some of which were ornamented with silver. One of the knives was made, with its handle, out of a single piece of copper. It measured altogether about seven inches long, of which the blade was nearly two-thirds of the entire length, and of an oval shape. It was ornamented with pieces of silver attached to it, and was inlaid with a stripe of the same metal from point to haft. Along with these relics were also found numerous fragments, or chips and shavings of copper, some of which were such as, it was assumed, could only have been cut by a fine sharp tool; and the whole sufficed to indicate, even more markedly than those at Ontonagon, that not only was the native copper wrought in ancient times in the Lake Superior regions, but that along its shores, and on the banks of its navigable rivers, there existed manufactories where the native artisan fashioned the metal into tools and weapons for war and the chase.

A lively interest is felt throughout the copper regions in the relics of the ancient miners, and the modern occupants of their works manifest an intelligent appreciation of the uses of such antique remains as a means of throwing light on the history of former ages. I found a peculiar importance attached by the miners and others to the hardness of the wrought copper implements. This they contrasted, in more than one case, with the ductility of the chips and fragments of unwrought copper found along with them, as well as with the condition of the native copper when first brought from the mine, and maintained that it afforded proof of a knowledge acquired by the ancient metallurgist of some hardening process unknown to the modern copper-smith. It is well known that copper and bronze chisels are frequently found among the ancient relics of the Nile valley, and that the paintings of Egypt exhibit her sculptors hewing out the colossal memnons of limestone and granite by means of yellow-coloured tools, which may fairly be assumed to be made of the copper wrought by the Egyptians in the mines of Maghara, near Sinai, so early as the reign of Suphis, the builder of the great pyramid, though with them hardened by means of alloys. But though the bronze, at an early date, superseded the pure copper in use in Egypt, examples are not wanting of copper tools. Dr. John Forbes of Edinburgh has in his possession a large chisel of pure copper, exhibiting abundant marks of use, which he found, along with a wooden mallet, in an Egyptian tomb.

In 1856, Dr. Thomas Reynolds of Brockville exhibited to the Canadian Institute a collection of copper and other relics discovered in that neighbourhood under singular circumstances; and possessing a special interest owing to the distance of the site from the copper regions of Lake Superior. They included a peculiarly-shaped chisel

or gouge, six inches in length, figured here along with a spear-head, seven inches long, and one or two small daggers or knives, all wrought by means of the hammer out of native copper which had never been subjected to fire, as is proved by the silver remaining in detached crystals in the copper. The spot where these relics were found is at the head of Les Galops Rapids, on the River St. Lawrence; and the circumstances under which they were met with are thus narrated by Dr. Reynolds: "All these relics were found at a depth of about fourteen or fifteen

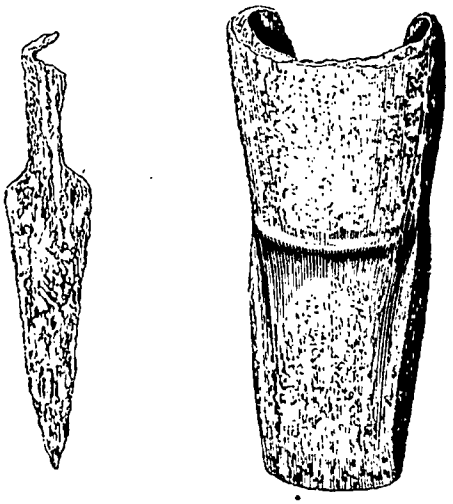


FIG. 13.—Brockville Copper Implements.

feet below the surface, in a soil composed of clay and sand. The shore at the point of land, which is considerably washed by the action of the rapid stream, presents a face of large granite boulders with quartz conglomerate: a fitting resting-place for the stalwart forms of a score of skeletons, which were found inhumed in a circular space with their feet towards the centre. Some of the skeletons were of gigantic proportions. The lower jaw of one is sufficiently large to surround the corresponding bone of an adult of our present generation.

The condition of the bones furnished indisputable proof of their great antiquity. The skulls were so completely reduced to their earthy constituents that they were exceedingly brittle, and fell in pieces when removed and exposed to the atmosphere. The metallic remains, however, of more enduring material, as also several stone chisels, gouges made of the same durable material, and some flint arrow-heads, all remain in their original condition, and furnish evidence of the same rude arts which we know to be still practised by the aborigines of the far West. With reference to the question whether these copper remains are of European or native origin, their structure is very rude; they appear to have been wrought solely by means of the hammer, without the melting-pot or the aid of fire; while they were accompanied by stone and flint tools and weapons, no implements were found made of iron; and finally, the copper appears to correspond in quality with the specimens of the native metal now found in such large quantities on the shores of Lake Superior. There is also a curious fact, which these relics appear to confirm, that the Indians possessed the art of hardening and tempering copper, so as to give it as good an edge as iron or steel. This ancient Indian art is now entirely lost."

The reference thus made to the popular theory of some lost art of hardening the native copper, afforded an opportunity of testing it in reference to the Brockville relics. They were accordingly submitted to my colleague, Professor Henry Croft, of University College, Toronto, with the following results: "The object of the experiments was to ascertain whether the metal of which those implements are made is identical with the native copper of the Lake Superior mines, or whether it has been subjected to some manufacturing process, or mixed with any other substance, by which its hardness might

have been increased. A careful examination establishes the following conclusions:—No perceptible difference could be observed in the hardness of the implements, and that of metallic copper from Lake Superior. The knife or small dagger was cleansed as far as possible from its green coating; and its specific gravity ascertained as 8·66. A fragment, broken off the end of the broad, flat implement, described as a 'copper knife of full size,' having been freed from its coating, was found to have a specific gravity of 8·58. During the cleaning of this fragment, a few brilliant white specks became visible on its surface; they appeared to be silver, from their colour and lustre. The structure of the metal was also highly laminated, as if the instrument had been brought to its present shape by hammering out a solid mass of copper, which had either split up, or had been originally formed of several pieces. These laminæ of course contained air, and the metal was covered with rust, hence the specific gravity. The process by which a flat piece of copper has been overlapped, and wrought with the hammer into a rude spear-head, is shown in the accompanying illustration. A portion of very solid cop-

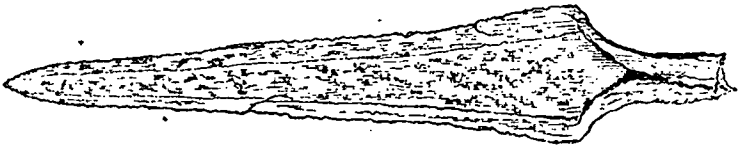


Fig. 14.—Brockville Copper Spear.

per, from Lake Superior, of about the same weight as the fragment, was weighed in water, and its gravity found to be 8·92; in this piece there were no cavities perceptible. The specific gravity of absolutely pure copper varies from 8·78 to 8·96, according to the greater or less degree of aggregation it has received during its manufacture. The small difference between these numbers leads

to the conclusion that the implements were made of pure copper. The fragment was completely dissolved by nitric acid; and the solution, on being tested for silver by hydrochloric acid, gave a scarcely perceptible opacity, indicating the presence of an exceedingly minute trace of silver. The copper having been separated by hydrosulphuric acid, the residual liquid was tested for other metals. A very minute trace of iron was detected. The native copper from Lake Superior was tested in the same manner, and was found to contain no trace of silver, but a minute trace of iron, the quantity being apparently about the same as in the fragment. From this, it appears that the implements are composed of copper almost pure, differing in no material respect from the native copper of Lake Superior."

The result of the above experiments is sufficient to show that, in the case of the Brockville relics, the theory of a lost art of hardening and tempering copper, was a mere reflex of the prevalent popular fallacy without the slightest foundation in fact; and there is no reason for anticipating a different result in other cases in which the same theory is tested.

In his account of the discovery of those relics, Dr. Reynolds assumes them to pertain to the present Indian race. It is obvious, however, that the evidences of antique sepulture are unmistakable, and other proofs suggest a different origin. Mr. Squier, by whom they have been described, remarks in the Appendix to his *Aboriginal Monuments of the State of New York*:[1] "Some implements entirely corresponding with these have been found in Isle Royale, and at other places in and around Lake Superior." But besides the copper implements, a miniature mask of terra-cotta lay in the same deposit, of peculiar workmanship, and suggestive rather of relation

[1] *Smithsonian Contributions*, vol. ii. pp. 14, 176.

to the arts of the Mound-Builders, or of Central America. It is figured by Mr. Squier from an incorrect drawing, which indicates a minuter representation of Indian features than the original justifies. It may rather be described as a grotesque mask, such as is by no means uncommon among the small terra-cottas of Mexico and Central America. It is accurately engraved here, the size of the original, from a photographic copy.

Fig. 15.—Terra-cotta Mask.

The mingling of traces of a certain amount of artistic skill, as here seen, with the rude arts of the primitive metallurgist, entirely correspond with the disclosures of the ancient mounds of the Mississippi; and, indeed, agree with other examples of the partial manifestations of artistic skill in an imperfectly developed civilisation. I was struck, when examining the rude mauls of the ancient miners of Ontonagon, by the close resemblance traceable between them and some which I have seen obtained from ancient copper workings discovered in North Wales.

In a communication made to the British Archæological Institute by the Hon. William Owen Stanley, in 1850, he gives an account of an ancient working broken into at the copper mines of Llandudno, near the Great Orme's Head, Carnarvonshire. In this were found mining implements, consisting of chisels, or picks of bronze, and a number of stone mauls of various sizes, described as weighing from about 2 lbs. to 40 lbs., rudely fashioned: having been all, as their appearance suggested, used for breaking, pounding, or detaching the ore from

the rock, and pertaining, it may be presumed, to a period anterior to the Roman occupation of Britain. These primitive implements are stated to be similar to the water-worn stones found on the sea-beach at Pen Mawr, from which very probably those most suitable for the purpose may have been selected. Mr. Stanley also describes others of precisely the same character, and corresponding exactly with those found on the shores of Lake Superior, which had been met with in ancient workings in Anglesea. Were we, therefore, disposed to generalize from such analogies, as ingenious speculators on the lost history of the New World have been prone to do, we might trace in this correspondence between the ancient mining implements of Lake Superior and of North Wales, a confirmation of the supposed colonization of America, in the twelfth century, by Madoc, the son of Owen Gwynnedd, king of North Wales, who, according to the Welsh chroniclers, having been forced by civil commotions to leave his native country, set sail with a small fleet in 1170, and directing his course westward, landed, after a voyage of some weeks, in a country inhabited by a strange race of beings, but producing in abundance the necessaries of life. Leaving behind him a colony of settlers, Prince Madoc, according to the same authorities, returned to Wales, equipped a larger fleet, and again set sail for the new regions of the West; but neither he nor any of his followers were ever more heard of. The general story has nothing improbable in it. If a small colony of Welshmen effected a settlement on the shores of America at that early date, their fate would be like that of the still earlier Scandinavian colonists of Vinland. But the resemblance between the primitive Welsh and American mining-tools, can be regarded as nothing more than evidence of the corresponding operations of the human mind, when placed under similar cir-

cumstances with the same limited means, which is illustrated in so many ways by the arts of the stone period, whether of the most ancient or the most modern date. Nor can such numerous correspondences be regarded as altogether accidental. They confirm the idea of certain innate and instinctive operations of human ingenuity, ever present and ready to be called forth for the accomplishment of similar purposes by the same limited means; and which reveal to us the same type in the works of the ancient Mound-Builder, and the relics of the British barrow of ante-Christian times, as among the most recent products of the Red Indian or the Polynesian artificer. Yet the important fact must be borne in remembrance that the flint weapons of the drift, so far as hitherto figured and described, differ to a remarkable extent from those found in the ancient barrows. They are much larger, ruder, and of different forms; and it is a remarkable fact, the significance of which is not yet fully apparent to us, that the stone axe of the South Sea Islander of the eighteenth century, presents a close resemblance to that of the British or Gaulish fabricator of the first, or earlier centuries; and the modern flint lance or arrow-head of the Red Indian can scarcely be distinguished from that found in the most ancient British graves: while no such correspondence is traceable between the latter and the still older manufactured weapons in the underlying drift.

From the review thus made of the evidences of ancient and long-abandoned mining operations on the shores and islands of Lake Superior, it cannot admit of doubt that in these works we look on the traces of an imperfectly developed yet highly interesting native civilisation, pertaining to centuries long anterior to that lifting of the curtain concealing America from the ancient world, which introduced to the children of its forests

the products of an exotic civilisation, for them pregnant only with destruction.

The question naturally arises: By whom were those ancient mines of the northern copper region wrought? Was it by the ancestry of the present Indian tribes of North America, or by a totally distinct and long-superseded race? The whole tendency of opinion among American writers has latterly been towards a unity and comprehensive isolation of the races and arts of the New World; and hence the theories alike of Morton and of Schoolcraft, though founded on diverse and totally independent premises, have favoured the idea that the rude germs of all that is most noticeable even in the civilisation of Central America may be found among the native arts and the manners and customs of the forest tribes. But neither the traditions nor the arts of the Indians of the northern lakes supply any satisfactory link connecting them either with the Copper-miners or the Mound-Builders. Loonsfoot, an old Chippewa chief, living at the mouth of St. Louis River, where it enters Lake Superior, is said to trace back his ancestry by name, as hereditary chiefs of his tribe, for upwards of four hundred years. At the request of Mr. C. Whittlesey he was questioned by an educated half-breed, a nephew of his own, relative to the ancient copper mines, and his answer was in substance as follows:—"A long time ago the Indians were much better off than they are now. They had copper axes, arrow-heads, and spears, and also stone axes. Until the French came here, and blasted the rocks with powder, we have no traditions of the copper mines being worked. Our forefathers used to build big canoes and cross the lake over to Isle Royale, where they found more copper than anywhere else. The stone hammers that are now found in the old diggings we know nothing about. The Indians were formerly

much more numerous and happier. They had no such wars and troubles as they have now." At La Pointe on Lake Superior, it was my good fortune to meet with Buffalo, a rugged specimen of an old Chippewa chief. He retained all the wild Indian ideas, though accustomed to frequent intercourse with white men, boasted of the scalps he had taken, and held to his pagan creed as the only religion for the Indian, whatever the Great Spirit might have taught the white man. His grandson, an educated half-breed, acted as interpreter, and his reply to similar inquiries was embodied in the following sententious declaration of Indian philosophy:—"The white man thinks he is the superior of the Indian, but it is not so. The Red Indian was made by the Great Spirit, who made the forests and the game, and he needs no lessons from the white man how to live. If the same Great Spirit made the white man, he has made him of a different nature. Let him act according to his nature; it is the best for him; but for us it is not good. We had the red-iron before white men brought the black-iron amongst us; but if ever such works as you describe were carried on along these Lake shores before white men came here, then the Great Spirit must once before have made men with a different nature from his red children such as you white men have. As for us, we live as our forefathers have always done."

La Pointe, or Chaquamegon, where this interview took place, was visited by the Jesuit Father, Claude Alloüez, in the month of October 1666, and is described by him as a beautiful bay, the shores of which were occupied by the Chippewas in such numbers that their warriors alone amounted to eight hundred. In the journal of his travels, he thus refers to the mineral resources for which the region is now most famed:—"The

savages reverence the lake as a divinity, and offer sacrifices to it because of its great size, for it is two hundred leagues long and eighty broad; and also, because of the abundance of fish it supplies to them, in lieu of game, which is scarce in its environs. They often find in the lake pieces of copper weighing from ten to twenty pounds. I have seen many such pieces in the hands of the savages; and as they are superstitious, they regard them as divinities, or as gifts which the gods who dwell beneath its waters have bestowed on them to promote their welfare. Hence they preserve such pieces of copper wrapped up along with their most prized possessions. By some they have been preserved upwards of fifty years, and others have had them in their families from time immemorial, cherishing them as their household gods. There was visible for some time, near the shore, a large rock entirely of copper, with its top rising above the water, which afforded an opportunity for those passing to cut pieces from it. But when I passed in that vicinity nothing could be seen of it. I believe that the storms, which are here very frequent, and as violent as on the ocean, had covered the rock with sand. Our Indians wished to persuade me it was a divinity which had disappeared, but for what reason they would not say."[1]

Such is the earliest notice we have of the Indian ideas of the native copper, and their mode of acquiring it. It entirely accords with all subsequent information on the same subject, and is opposed to any tradition of their ancestors having been the workers of the abandoned copper mines. A secrecy, resulting from the superstitions associated with the mineral wealth of the great Lake, appears to have thrown impediments in the way of the earlier inquirers after the sources of

[1] *Relations des Jésuites*, vol. iii. 1666 *et* 1667.

the copper. Father Dablon, another member of the Society of Jesus, narrates a marvellous account communicated to him, of four Indians who, in old times, before the coming of the French, had lost their way in a fog, and at length effected a landing on Missipicooatong. This was believed to be a floating island, and mysteriously variable in its local position and aspects. The wanderers cooked their meal in Indian fashion, by heating stones and casting them into a birch-bark pail filled with water. The stones proved to be lumps of copper, which they carried off with them; but they had hardly left the shore, when a loud and angry voice, ascribed by one of them to Missibizi, the goblin spirit of the waters, was heard exclaiming, "What thieves are these that carry off my children's cradles and playthings?" One of the Indians died immediately from fear, and two others soon after, while the fourth only survived long enough to reach home and relate what had happened, before he also died, having no doubt been poisoned by the copper used in cooking. Ever after this the Indians steered their course far off the site of the haunted island. In the same relation, Father Dablon tells that near the river Ontonagon, or Nantonagon as he calls it, is a bluff from which masses of copper frequently fall out. One of these was presented to him weighing one hundred pounds; and pieces weighing twenty or thirty pounds are stated by him to be frequently met with by the squaws when digging holes for their corn. The locality thus celebrated for the traces of its mineral wealth by the earliest French missionaries, is in like manner referred to by the first English explorer, Alexander Henry, a bold adventurer, who visited the Island of Mackinac, at the entrance of Lake Michigan, shortly before the Treaty of Paris in 1763, and was one among the few who escaped a

treacherous massacre perpetrated by the Indians on the whites at Old Fort Mackinac. In his *Travels and Adventures in Canada and the Indian Territories,* he mentions his visiting the River Ontonagon, in August 1765. "At the mouth, was an Indian village; and at three leagues above, a fall, at the foot of which sturgeon were at this season so abundant, that a month's subsistence for a regiment could have been taken in a few hours. But," he adds, "I found this river chiefly remarkable for the abundance of virgin copper which is on its banks and in its neighbourhood. The copper presented itself to the eye in masses of various weight. The Indians showed me one of twenty pounds. They were used to manufacture this metal into spoons and bracelets for themselves. In the perfect state in which they found it, it required nothing but to be beat into shape."[1] On a subsequent occasion, in the following year, Henry again visited the same region. "On my way," he says, "I encamped a second time at the mouth of the Ontonagon, and now took the opportunity of going ten miles up the river, with Indian guides. The object which I went most expressly to see, and to which I had the satisfaction of being led, was a mass of copper, of the weight, according to my estimate, of no less than five tons. Such was its pure and malleable state that with an axe I was able to cut off a portion weighing a hundred pounds."[2] This mass of native copper which thus attracted the adventurous European explorer nearly a century ago, has since acquired considerable celebrity, as one of the most prominent encouragements to the mining operations projected in the Ontonagon and surrounding districts, and is now preserved at Washington. Those notices are interesting as showing to what extent

[1] Henry's *Travels and Adventures*, New York, 1809, p. 194.
[2] *Ibid.* p. 204.

the present race of Indians were accustomed to avail themselves of the mineral wealth of the great copper regions, and by what means they acquired such copper as they were found in possession of, along with their weapons and implements of stone. Illustrations of a like kind might be greatly multiplied, but they are all nearly to the same effect, exhibiting the rude Indian gathering the chance masses, or hewing off pieces from the exposed copper lodes, in full accordance with the simple arts of his first stone period; but affording no ground for crediting him with even the most partial traditionary memorials of any ancestral connexion with the industrial mining race that once diligently excavated the trenches, and laid bare the mineral treasures of the great copper region.

The evidences which tend to prove the great length of time which has intervened since the ancient mines of Lake Superior were abandoned, receives further confirmation from the traces of a long-protracted traffic carried on by the subsequent occupants of their abandoned territory. The mineral wealth that still lay within the reach of the non-industrial hunter of the forests which grew up and clothed the deserted works, in the interval between their abandonment and re-occupation, furnished him with a prized material for barter. The head-waters of the Mississippi lie within comparatively easy reach of an Indian party, carrying their light birch-bark canoe over the intervening portages, as is practised by them at the present day; and, once launched on its broad waters, the whole range of the continent through twenty degrees of latitude is free before them. Through Lake Huron and the Ottawa into the St. Lawrence, and by Lakes Huron, Erie, and Ontario, into the Hudson, other extensive areas of native exchange were commanded. Articles wrought in the brown pipe-stone of the Chip-

pewa river of the Upper Mississippi, the red pipe-stone of the Couteau des Prairies, west of St. Peters, and the copper of Lake Superior, constituted the wealth which the old North had to offer; and, in return, one of the most valued exchanges appears to have been the large tropical shells of the Gulf of Florida and the West Indian seas; from which wampum-beads, pendants, gorgets, and personal ornaments of various kinds were manufactured; while many of them, as we have seen, were preserved entire, and evidently prized, along the shores of the northern lakes, as among the most marvellous of natural productions.

These conchological relics, and the circumstances under which they have been discovered, have already been described in a former chapter. They are of peculiar value in the present inquiry, from the illustration they afford of the area embraced by the ancient native traffic between the North and South. Whatever doubt may be thrown on the derivation of some specimens of ancient native manufacture, or of the copper found in sepulchral and other deposits in the Southern States and in Central America: no question can exist as to the tropical and marine origin of the large shells exhumed not only in the inland regions of Kentucky and Tennessee, but in the northern peninsula lying between the Ontario and Huron lakes, or on the still remoter shores and islands of Georgian Bay, at a distance of upwards of three thousand miles from the coast of Yucatan, on the mainland, the nearest point where the *Pyrula perversa* is found in its native locality.

Such evidence as the habits, arts, and traditions of the Indian tribes around Lake Superior supply, seems all to point in the same direction, and to be irreconcilable with the idea that they are the descendants of the ancient miners. The stray lumps of native copper, and

the exposed masses from which pieces could readily be separated, have indeed long supplied them with the prized *miskopewabik*, or red iron; and the peculiar manner in which crystals of silver are frequently enclosed in the copper of Lake Superior, enables its source to be traced wherever it has been wrought exclusively by the hammer without the application of fire. Copper, however, is obtained in its native state still farther north; and Mackenzie, in his *Second Journey*, mentions its being in common use among the tribes on the borders of the Arctic Sea; by whom it is wrought into spear and arrow heads, and a considerable variety of personal ornaments. Mr. Henry also found the Christinaux of Lake Winipagon wearing bracelets and other ornaments of copper; and most of the earlier voyagers and explorers describe copper implements and personal ornaments among the widely-scattered Indian tribes of the New World. But in all cases they were rudely wrought with the hammer, and sparingly mingled with the more abundant weapons and implements of stone, made by a people whose sole metallurgic knowledge consisted in gathering or procuring by barter the native copper,—just as they procured the red or brown pipe-stone,—and hammering the mass into some simple useful form. Silver, procured in like manner, was not unknown to them, and pipes inlaid both with silver and lead are by no means rare. It is only when we turn to the scenes of a native-born civilisation, in Mexico, Central America, and Peru, that we find actual metallurgic arts in use, and discover the crucible and furnace, and copper superseded by the more useful alloy, bronze. But intermediately between the copper regions of Lake Superior and the ancient southern scenes of native American civilisation, the Mississippi and its great tributaries drain a country remarkable for monuments of a long

forgotten past, not less interesting and mysterious than the forsaken mines of Keweenaw and Ontonagon, or Isle Royale. These great earthworks are ascribed to an extinct race, conveniently known by the name of the Mound-Builders. Extensive and carefully executed investigations into their structure and contents prove these builders to have been a people among whom copper was in frequent use, but by them also it was worked from the native metal only by the hammer. The invaluable service of fire in reducing and smelting ores, moulding metals, and adapting them to greater usefulness by well-proportioned alloys, was entirely unknown; and the investigation and analysis of their cold-wrought tools seem to prove that the source of their copper was the Lake Superior mines. But though the ancient Mound-Builder was thus possessed of little higher metallurgic skill than the modern Indian hunter, he manifested in other respects a capacity for extensive and combined operations, the memorials of which perpetuate his monumental skill and persevering industry in the gigantic earthworks from whence his name is derived. From these we learn that there was a period, in the long past epochs of America's unrecorded history, when the valleys of the Mississippi and its tributaries were occupied by a numerous and settled population. Alike in physical conformation—so far as our very imperfect evidence goes,—and in arts, these Mound-Builders approximated to races of South America, and differed from the Red Indian tribes alone known to the Europeans as the occupants of their deserted seats, and therefore familiarly styled Aborigines. They were not, to all appearance, far advanced in civilisation. Compared with the people of Mexico or Central America, when first seen by the Spaniards, their arts and social state were probably rudimentary. But they had ad-

vanced beyond that stage in which it is possible for a people to continue utterly unprogressive. The initial steps of civilisation had been inaugurated, and the difference between them and the civilized Mexicans is less striking than the contrast which the evidences of their settled condition, and the proofs of extensive co-operation in their numerous earthworks supply, when compared with all that pertains to the nomade tribes by whom the American forests have been exclusively occupied during the centuries since Columbus. They were greatly more in advance of the Indian hunter than behind the civilized Mexican. They had already acquired habits of combined industry; were the settled occupants of a specific territory; and are proved, by the numerous ornaments and implements of copper deposited in their monuments and sepulchres, to have been familiar with the mineral resources of the northern lake regions, whether by personal enterprise, or by an ancient commercial system of exchange. What probabilities there are suggestive of a connexion between the Mound-Builders and the ancient miners of America, will be discussed in a later chapter, along with other and allied questions; but to just such a race, with their imperfect mechanical skill, their partially-developed arts, and their aptitude for continuous combined operations, may be ascribed, *à priori*, such ancient mining works as exist on the shores of Lake Superior, overshadowed with the forest growth of centuries. The mounds constructed by the ancient race are in like manner overgrown with the evidences of their long desertion; and the condition in which recent travellers have found the long-forgotten cities of Central America, may serve to show what even New York, Washington, and Philadelphia; what Toronto, Montreal, and Quebec, would become after a very few centuries, if abandoned, like the desolate cities of Chi-

chenitza or Uxmal, to the inextinguishable luxuriance of the American forest growth.

The history of some of the cities of Central America is known, and the date is well ascertained when the irruption of a new race extinguished the advancing civilisation of Mexico, and threw back into primitive barbarism the remnant of the ancient race which it failed to extirpate. It seems no illegitimate assumption to affirm of the Mound-Builders of the Mississippi, and the ancient miners of Lake Superior, in like manner, that some great catastrophe—the intrusion, it may be, of a barbaric but warlike race, such as the history of some of the great Indian confederacies illustrate, or the still deadlier influence of pestilence, such as in the seventeenth century swept away the Massacheuseuks and Narragansetts of New England;—abruptly arrested their labours, and restored the scenes of their industrious progression to the silence amid which the later forest-wilderness arose. It is not necessary to assume a very remote antiquity for the era of this abortive American civilisation. It has been a favourite theory with some, to trace analogies between the arts of Central America and those of Egypt's or Phœnicia's primitive maturity. But those who do so forget that the era of Montezuma is known, and that to a past so recent as that, we can assign so much of Aztec, and even of the latest traces of Toltec art, that a few more centuries, such as in Europe would carry us back to the era of the rise of Moorish civilisation and mediæval Christian art, may suffice to embrace nearly all that we know of in relation to those of the New World. Certainly, however, no computation will account for the chronological data deducible from the mines of Lake Superior or the mounds of the Mississippi valley which does not considerably antedate the close of their era to that of the European discovery of the American continent.

In his communication to the American Association, Mr. C. Whittlesey endeavours to assign an approximate date to the era of the ancient miners. From a comparison of the trees found on the tops of the trenches and the extent of the works, with the difficulties which the miners had to encounter in working them, he considers that an interval of twelve hundred years have elapsed since the mines were abandoned, and five hundred years more must be allowed during which they were occupied and wrought. This would carry us back to the second century of the Christian era, when the ancient Damnonian of Cornwall practised his ingenious industry by means of arts not greatly in advance of the miners of Lake Superior. But the grounds for asserting such an antiquity for the works at Ontonagon or Keweenaw, are too vague to carry conviction to the mind. Were we as ignorant of the history of all the monuments of Mexico and Yucatan as of those of Ohio, there are not wanting ingenious theorists who would assign to the architecture of Central America a date still older than the pyramids of Egypt. But whatever be the dates of their commencement or desertion, the condition in which some of the ancient works on Lake Superior have been found, when reopened in recent times, is suggestive of peculiar circumstances attending their abandonment. It is difficult to believe that the huge mass of copper, upwards of six tons in weight, discovered beneath the rubbish of centuries in the Minnesota mine, resting on its oaken cradle, was abandoned merely because the workmen, who had thus overcome one of the greatest difficulties in its removal, were baffled in the subsequent stages of their operations, and contented themselves by chipping off any accessible projecting point. Well-hammered copper chisels, such as lay alongside of it, and have been repeatedly found in the works, were abundantly sufficient, with the

help of the accompanying stone hammers, to enable them to cut the mass of native copper into portable pieces. If, indeed, the ancient miners were incapable of doing more with their mass of copper in the mine, than breaking off a few projections, to what further use could they have turned it when transported to the surface? It weighed six tons, and measured ten feet long and three feet wide. The trench at its greatest depth was twenty-six feet; while the mass of copper was only eighteen feet from the surface, and in the estimation of the skilled engineer by whom it was first seen, it had been elevated upwards of five feet since it was placed on its oaken frame, and supported by sleepers of the same material. The excavations to a depth of twenty-six feet, the dislodged copper block, and the framework prepared for elevating the solid mass to the surface, all consistently point to the same workmen. But the mere detachment of a few accessible projecting fragments is too lame and impotent a conclusion of proceedings carried thus far on so different a scale. It indicates rather such results as would follow at the present day were the barbarian tribes of the North-west to displace the modern Minnesota miners, and possess themselves of mineral treasures they are as little capable as ever of turning to any but the most simple and rude uses. Such evidences, accordingly, while they serve to prove the existence, at some former period, of a mining population in the copper regions of Lake Superior, seem also to indicate that their labours had come to an abrupt termination. Whether by some terrible devastating pestilence, like that which nearly exterminated the native population of New England immediately before the landing of the Pilgrim Fathers; or by the breaking out of war; or, as seems not less probable, by the invasion of the mineral region by a barbarian race, ignorant of all the arts of the ancient

Mound-Builders of the Mississippi, and of the miners of Lake Superior: certain it is that the works have been abandoned, leaving the quarried metal, the laboriously wrought hammers, and the ingenious copper tools, just as they may have been left when the shadows of the evening told their long-forgotten owners that the labours of the day were at an end, but for which they never returned. Nor during the centuries which have elapsed since the forest reclaimed the deserted trenches for its own, does any trace seem to indicate that a native population again sought to avail themselves of their mineral treasures, beyond the manufacture of such scattered fragments as lay upon the surface.

CHAPTER IX.

THE METALLURGIC ARTS: ALLOYS.

THE age of bronze in the archæological history of European civilisation symbolizes a transitional stage of very partial development, and imperfect materials and arts, through which the Old World passed in its progress towards the maturity of true historic times; but the bronze period of the New World is the highest stage of its self-developed civilisation, prior to the intrusion of European arts. Whether we regard the bronze implements of Britain and the North of Europe as concomitant with the intrusion of a new stock, or only as proofs of the discovery or introduction of a new art pregnant with many civilizing and elevating tendencies, they constitute an important element in primitive ethnology. For a time they necessarily coincide with many monuments and works of art pertaining in character to the stone period; just as the stone implements and weapons still manufactured by the Indians and Esquimaux are contemporaneous with the intruding products of foreign metallurgy, but nevertheless are the perpetuation of processes developed in a period when metallurgic arts were entirely unknown. The evidence that the British bronze period succeeded to that simpler and ruder one of stone is such as scarcely to admit of challenge, independent of the *à priori* likelihood in favour of this order of succession. The question however suggests itself whether metallurgy

did not find its natural beginning in the easy working of the virgin copper, and so intercalate a copper age between Europe's stone and its true bronze period. On this subject, Dr. Latham remarks, in his *Ethnology of the British Islands*, "Copper is a metal of which, in its unalloyed state, no relics have been found in England. Stone and bone first; then bronze, or copper and tin combined; but no copper alone. I cannot get over this hiatus; cannot imagine a metallurgic industry beginning with the use of alloys." It is a mistake, however, to say that no unalloyed British copper relics have been found. No very special attention has been directed hitherto to the distinction. Nearly all the earlier writers who refer to the metallic weapons and tools of ancient Mexico and Central America, apply the term "copper" to the mixed metal of which these were made; while among British and European antiquaries the corresponding relics of the Old World are no less invariably designated bronze, though in many cases thus taking for granted what analysis could alone determine. It is an error, however, that the later nomenclature of archæological periods has tended to strengthen; partly from the lack of appreciation of the importance of the argument thus suggested by Dr. Latham. But examples of British primitive implements of pure copper have already been noted. In a valuable paper by J. A. Phillips, F.C.S., on the metals and alloys known to the ancients, printed in the 4th vol. of the *Memoirs of the Chemical Society*, the results of analysis of thirty-seven ancient coins and other bronzes are given. Among these are included three bronze swords, one from the Thames, the others from Ireland; a spear-head, two celts, and two axe-heads; all of types well known among the weapons of the "bronze period." Yet of these eight articles, selected as examples of "bronze" weapons, one of them, the spear-head, proved

on analysis to be of impure but unalloyed copper. Its composition is given as copper, 99·71; sulphur, 28. In the *Edinburgh Philosophical Journal*, of February 1822, there is an account, from the pen of Sir David Brewster, then one of its editors, of a large battle-axe of pure copper, found at a depth of twenty feet in Ratho Bog, near Edinburgh, under circumstances scarcely less remarkable than some of the discoveries of works of art in the drift. It differed from all the specimens preserved in the Museum of the Scottish Antiquaries. The workmen dug down through nine feet of moss and seven feet of sand, before they came to the hard black till-clay; and at a depth of four feet in the clay the copper axe was found. The author accordingly remarks: "It must have been deposited along with the blue clay prior to the formation of the superincumbent stratum of sand, and must have existed before the diluvial operations by which that stratum was formed. This opinion of its antiquity is strongly confirmed by the peculiarity of its shape, and the nature of its composition."[1] When, in 1850, my brother, Dr. George Wilson, undertook a series of analyses of ancient British bronzes for me, out of seven specimens selected for experiment, one Scottish axe-head, rudely cast, apparently in sand, was of nearly pure copper. The iron and silver in it did not amount together to one per cent., and were, no doubt, naturally present in the copper. In this case no record was made of the fact, as the object in view was to compare quantitatively the composition of different ancient bronzes, in order to test the theory of a supposed common source of the alloy.[2] Again, during the past year, I procured, through the kind services of Mr. Thomas Ewbank, of New York, eight specimens of metal implements, all

[1] *Edinburgh Philosophical Journal*, vol. vi. p. 357.
[2] *Prehistoric Annals of Scotland*, p. 246.

selected as examples of Peruvian bronze; but, on analysis, four of them proved to be of unalloyed copper. The rich collections of the Royal Irish Academy furnish singularly interesting confirmation to this idea of a transitional copper era. Dr. Wilde remarks, in his Catalogue of Antiquities, that "upon careful examination, it has been found that thirty of the rudest, and apparently the very oldest celts, are of red, almost unalloyed copper." In addition to these there are also two battle-axes, a sword-blade, a trumpet, several fibulæ, and some rudely formed tools, all of copper; and now that attention has been directed to the subject, further examples of the same class will doubtless be noted.

A very important difference, however, distinguishes the mineral resources of the British and the North American copper regions. The copper, as we have seen, occurs in the trappean rocks of Keweenaw and Ontonagon, in masses of many tons weight, and detached blocks of various sizes lie scattered about in the superficial soil or exposed along the lake shore, ready for use without any preparatory skill, or the slightest knowledge of metallurgy. Nature in her own vast crucibles had carried the metal ores through all their preparatory stages, and left them there for man to shape into such forms as his convenience or simplest wants suggested. The native silver had undergone the like preparation, and is of frequent occurrence as a perfectly pure metal, being found, even when interspersed in the mass of copper, still in distinct crystals, and entirely free from alloy with it. But neither tin nor zinc occurs throughout the whole northern region to suggest to the native metallurgist the production of that valuable alloy which is indissolubly associated with the civilisation of Europe's bronze age. In Britain it is altogether different. The tin and copper lie together, ready for alloy, but both occur in the state of impure

ores, inviting and necessitating the development of metallurgy before they can be turned to economic uses. Tin is almost entirely obtained in Cornwall, from its peroxide, and copper occurs there chiefly combined with sulphur and iron, forming the double sulphuret which is commonly called copper pyrites or yellow copper ore. The smelting process to which it has to be subjected is a laborious and complicated one, and if we are prepared to believe in the civilisation of Britain's bronze period as a thing of native growth, the early discovery and use of alloys very slightly affects the question. The ancient American miner of Lake Superior never learned to subject his wealth of copper to the action of fire, and transfer it from the crucible to the shapely mould. No such process was needed where it abounded in inexhaustible quantities in a pure metallic state. If he, in the midst of such readily available metallic resources, was found to have used tools of bronze or brass, to have transported the tin or zinc of other regions to his furnaces, and to have laboriously converted the whole into a preferable substitute for the simpler metal that lay ready for his use, it would be difficult indeed to conceive of such as the initial stage in his metallurgic industry. But Britain presents no analogy to this in its development of metallurgic arts. Tin, one of the least widely diffused of metals, is found there in the greatest abundance, and easily accessible, not as a pure metal, but as an ore which is readily reduced by charcoal and a moderate degree of heat to that condition. This was the metallic wealth for which Britain was sought by the fleets of ancient Phœnicia, and on it we may therefore assume her primitive metallurgists to have first tried their simple arts. But alongside of it, and even in natural combination with it, as in tin pyrites and the double sulphuret, lies the copper, also, in the condition of an ore, and requiring the

application of the metallurgist's skill before it can be turned to account. We know that at the very dawn of history tin was exported from Britain. Copper also appears to have been wrought there from very early times, in North Wales as well as in Cornwall. Both metals were found rarely, and in small quantities, in a native state, but these may have sufficed to suggest the next step of supplying them in larger quantities from the ores. To seek in some unknown foreign source for the origin of metallurgic arts, which had there all the requisite elements for evoking them, is wholly gratuitous; and, if once the native metallurgist learned to smelt the tin and copper ores, and so had been necessitated to subject them to preparatory processes of fire, the next stage in progressive metallurgy, the use of alloys, was to him an exceedingly simple one. It might further be assumed that, with the discovery of the valuable results arising from the admixture of tin with copper, the few pure copper implements—excepting where already deposited among sepulchral offerings,—would for the most part be returned to the melting-pot, and reproduced in the more perfect and useful condition of the bronze alloy. There seems, however, greater probability in the supposition that Britain never had a copper period, or an age of unalloyed metals, other than of the briefest and most transitory character.

The *cassiteron*, or tin, which made the British Islands famous among Phœnician and Greek mariners, long before the Roman legions ventured to cross the narrow seas, was derived, as has been noted, from the same south-western peninsula, where rich veins of copper are still wrought. The name of Cassiterides, or Tin Islands, bestowed on Cornwall and the adjacent isles, seems to imply that the tin was the chief export, and was transported to the great Mediterranean ports, to be mixed

with the copper of the Wady Maghara, and other Asiatic mines, to form the Egyptian, Phœnician, and Assyrian bronze. Tin, therefore, the easiest of all metals to subject to the requisite processes, first engaged the skill of the ingenious British metallurgist; and that mastered, the proximity of the copper ore in the same mineral districts, inevitably suggests all the subsequent processes of smelting, fusion, and alloy. But Phœnicia had learned the value of tin, and its application for the purposes of alloy, before her merchantmen sought their mineral freight at the remote seaports of Cornwall and Devon. The native Briton had also acquired his independent knowledge of it before the Phœnician trader visited his shores; for it is inconceivable that the mineral treasures of Cornwall and Devon were first discovered by wandering mariners from the Levant. More probably their ores and metals first reached the Mediterranean through Gaul; and the fame of their mineral wealth tempted the commercial enterprise of Tyre and Sidon to explore the mysteries of northern seas.

The practical value of the alloy of copper and tin was already well known both to the Phœnician and Egyptian. Tin occurs in considerable abundance, and in the purest state, in the peninsula of Malacca, and thence, probably, it was first brought to give a new impetus to early eastern civilisation. Britain is its next and its most abundant source; and since America was embraced within the world's sisterhood of nations, Chili and Mexico have become known as productive sources of the same useful metal.

But the mineral wealth of Mexico and Peru was familiar to the nations of the New World long before it was made to contribute to European commerce; and to the proximity of the metals best suited for the first stages of human progress, may be ascribed in part the curious

phases of a native and purely aboriginal civilisation, which revealed itself to the wondering gaze of the first European adventurers who followed in the steps of Columbus. Whatever doubts may arise relative to the native origin of British metallurgy, and the works of art of the European bronze period, in consequence of their most characteristic illustrations being preserved in the mixed metal, bronze, and not in pure copper, there is no room for any such doubts relative to the primitive metallurgy of the New World. North America appears to have had its two distinct and entirely independent centres of self-originated metallurgic arts; its greatly prolonged but slightly progressive copper period; and apart from this, and probably, in part at least, contemporaneous with it, its separate bronze period, with its distinct centres of more advanced civilisation, and better regulated metallurgic industry, in which the value of metallic alloys was practically understood.

The great copper region of North America, with its rich supplies of pure native metal, accessible to the rudest efforts of the aboriginal miner, has already been fully described. It lies along the shores of Lake Superior, and on its larger islands between the 46th and 48th parallels of north latitude; and from thence its metallic treasures were diffused by barter and primitive commercial exchanges, throughout the whole vast regions watered by the Mississippi and its tributaries; including also the Atlantic states, and the shores of the great lakes. But southward and westward of this great area of diffusion, the Rio Grande and its tributaries, with the Rio Colorado, drain a country modified by very diverse conditions of climate, and having a totally distinct southern centre of metallurgic wealth and civilizing influences. In this central region of the twin continents of America, as well as independently in the more southern

tropical Peru, a native civilisation had advanced a considerable way, before it was arrested and destroyed by the mercenary aggressions of foreign intruders. The peculiar advantages derivable from the native proximity of the distinct metals had been discovered, and metallurgy had been developed into the practical arts of a true American bronze period.

When Columbus, during his fourth voyage, landed on one of the Guanaja islands, before making the adjoining mainland of Honduras, it was visited by a large trading canoe, the size and freight of which equally attracted his notice. It was eight feet wide, and in magnitude like a galley, though formed of the trunk of a single tree. In the centre a raised awning covered and enclosed a cabin, in which sat a cacique with his wives and children; and twenty-five rowers propelled it swiftly through the water. The barque is believed to have come from the province of Yucatan, then about forty leagues distant, through a sea the stormy violence of which had daunted the most hardy Spanish seamen. It was filled with a great variety of articles of manufacture, and of the natural produce of the neighbouring continent; and among them Herrara specifies "small hatchets, made of copper, small bells and plates, *crucibles to melt copper*, etc." Here, at length, was the true answer to that prophetic faith which upheld the great discoverer, when, peering through the darkness, the New World revealed itself to his eye in the glimmering torch, which told him of an unseen land inhabited by man. Here was evidence of the intelligent service of fire. Well indeed might it have been for Columbus had he been obedient to the voice that thus directed his way. All the accompaniments of the voyagers furnished evidence of civilisation. They were clothed with cotton mantles. Their bread was made of the Indian

corn, and from it also they had brewed a beverage resembling beer. They informed Columbus that they had just arrived from a country, rich, populous, and industrious, situated to the west, and urged him to steer in that direction. But his mind was bent on the discovery of the imaginary strait that was to lead him directly into the Indian seas. "Well would it have been for Columbus," exclaims Washington Irving, "had he followed their advice. Within a day or two he would have arrived at Yucatan; the discovery of Mexico, and the other opulent countries of New Spain, would have necessarily followed; the Southern Ocean would have been disclosed to him, and a succession of splendid discoveries would have shed fresh glory on his declining age, instead of its sinking amidst gloom, neglect, and disappointment." Not Columbus's own future, indeed, but the whole future of the New World might have been changed. But it was not so to be.

When at length the mainland was reached, the abundance and extensive use of the metals became speedily apparent; and as further discoveries brought to the knowledge of the Spaniards the opulent and civilized countries of Yucatan, Mexico, and Peru, which the project of reaching the Asiatic mainland had prevented Columbus from discovering, they were more and more astonished by the native metallic wealth. When the Spaniards first entered the province of Tuspan, they mistook the bright copper or bronze axes of the natives for gold, and were greatly mortified after having accumulated them in considerable numbers to discover the mistake they had made. Bernal Diaz narrates that "each Indian had, besides his ornaments of gold, a copper axe, which was very highly polished, with the handle curiously carved, as if to serve equally for an ornament as for the field of battle. We first thought

these axes were made of an inferior kind of gold; we therefore commenced taking them in exchange, and in the space of two days had collected more than six hundred; with which we were no less rejoiced, as long as we were ignorant of their real value, than the Indians with our glass beads."

In the form of copper wedges or axes, as we learn from the ancient Mexican paintings, the tribute due by certain provinces of the Mexican empire was paid; and Dupaix describes and figures examples of a deposit of two hundred and seventy-six axe-heads, cast of alloyed copper, such as, he observes, "are much sought by the silversmiths on account of their fine alloy." The forms of these, as well as of the chisels and other tools of bronze, are exceedingly simple, and indicate no great ingenuity in adapting the moulded metal to the more perfect accomplishment of the artificer's or the combatant's requirements than had been done in the ruder implements and weapons of stone. The methods of hafting the axe-blade, as illustrated by the ancient Mexican paintings, are all of the same rude description as are employed by the modern savage in fitting a handle to his hatchet of flint or stone; and, indeed, the whole characteristics of the metallurgic and artistic ingenuity of Mexico and Peru are suggestive of a civilisation very partially developed; though, from the nature of Peruvian institutions, the civilisation of Peru, like that of China, may have been in existence, with very slight and intermittent manifestations of progress, during many centuries. It was indeed, in many respects, the early transitional bronze period of the New World, in which not only the rude arts of the elder stone period had been very partially superseded or modified by metallurgic influences, but in which the stone axe, the sword, or *mahguahuitl*, made of wood, with blades of obsidian

inserted along its edge, the flint or obsidian arrow-head and the stone hatchets and other weapons, were in common use, along with those of metal. Yet also, along with such traces of the rudest primitive arts, remarkable progress had been made in some directions. Humboldt remarks, in his *Vues des Cordillères*, on the surprising dexterity shown by the Peruvians in cutting the hardest stones: "At Cañar, we find carved grooves hollowed in the porphyry, to supply the want of hinges to the doors. La Condamine and Bouguer saw, in old edifices built in the time of the Incas, ornaments of porphyry representing the muzzles of animals, in the perforated nostrils of which were movable rings of the same stone. When I crossed the Cordillera by the Paramo of Assuay, and saw the enormous masses of stone extracted from the porphyry quarries of Pullal, employed in constructing the high roads of the Inca, I already began to doubt whether the Peruvians were not acquainted with other tools besides hatchets of flint. I suspected that grinding was not the only method they had employed to smooth the stones, or give them a regular and uniform convexity; and I then adopted an opinion contrary to the ideas generally received. I conjectured that the Peruvians had tools of copper, which, mixed with a certain proportion of tin, acquires great hardness. This conjecture has been justified by the discovery of an ancient Peruvian chisel, found at Vilcabamba, near Cuzco, in a silver mine worked in the time of the Incas. This valuable instrument, for which I am indebted to the friendship of the Padre Narcisse Gilbar, is four and seven-tenth inches long, and four-fifths of an inch broad. The metal of which it is composed has been analysed by M. Vauquelin, who found in it 0·94 of copper, and 0·06 of tin." Unfortunately, the nature and composition of Mexican and Peruvian bronzes have hitherto attracted so little

attention, that it is impossible to obtain many accurate records of analyses, or to procure specimens to submit to chemical tests. Dr. J. H. Gibbon, of the United States Mint, has favoured me with the analysis of another chisel or crow-bar, brought from the neighbourhood of Cuzco by his son, Lieutenant Lardner Gibbon, who formed one of the members of the Amazon Expedition. Through the kind services of Mr. Thomas Ewbank, of the American Ethnological Society, I have also obtained in addition to results determined by himself, eight specimens of Peruvian implements, though only a portion of these proved to be formed of metallic alloys. They were submitted to careful analysis by my colleague, Professor Henry Croft, and the results in reference to the bronzes are given on a subsequent page.[1] Mr. Squier, in the Appendix to his *Aboriginal Monuments of the State of New York*, gives an engraving of an implement, somewhat of the shape of a shoemaker's paring-knife, which was found, with various other Peruvian knives and chisels, about the person of a mummy, taken by Mr. J. H. Blake, of Boston, from an ancient cemetery near Arica. On analysis, it proved to contain about four per cent. of tin. Having enjoyed opportunities of inspecting the valuable collection of antiquities brought by Mr. Blake from Peru, including a variety of bronze implements, he has favoured me with the following results of his investigations in this department of the subject :—"Many years ago, I made a series of analyses of bronze instruments, knives, chisels, hoes, etc., which I found in ancient cemeteries in Peru in connexion with embalmed bodies. I have not been able to find my notes made at the time ; but I know that they consisted of copper and tin only, and that the proportion of the latter varied from upwards of two to

[1] Analyses of Ancient American Bronzes, p. 312.

four per cent. After receiving your last letter, I made an analysis of a small knife found by me, with many other articles, with the body of a man, in the ancient cemetery near Arica, in South Peru. The handle is of the same metal as the blade, and at right angles with it, being joined at the middle. The end is fashioned to represent the head of a llama. On analysis, the composition proves to be: Copper, 97·87; tin, 2·13." Dr. C. T. Jackson communicated another analysis of a "Chilian bronze instrument, probably a crowbar," to the Boston Natural History Society. It contained 7·615 parts of tin, and is described by him as a bronze, well adapted for such instruments as were to be hammer-hardened.[1] The general result of the whole is to indicate a variable range of the tin alloy, from 2·13 to 7·615 per cent.; which, in so far as any general inference can be drawn from so small a number of examples, shows a greatly more indeterminate and partially developed metallurgy than the analyses of primitive European bronzes have disclosed.

Such is all the evidence I have been able to obtain relative to the composition of Peruvian alloys, and the progress indicated thereby in scientific metallurgy. It is altogether insufficient for any positive generalization; but, so far as it goes, it fully accords with the ideas otherwise formed of the Peruvians as a people who had discovered for themselves the rudiments of civilisation, but who had as yet very partially attained to any mastery of the arts which have been matured in modern centuries for Europe. This accords with the description furnished by Dr. Tschudi of some of the metallurgic processes still practised in Peru. "The Cordillera, in the neighbourhood of Yauli," he remarks, "is exceedingly rich in lead ore, containing silver. Within the circuit

[1] *Proceedings, B. N. H. S.*, vol. v. p. 63.

of a few miles above eight hundred shafts have been made, but they have not been found sufficiently productive to encourage extensive mining works. The difficulties which impede mine-working in these parts are caused chiefly by the dearness of labour and the scarcity of fuel. There being a total want of wood, the only fuel that can be obtained consists of the dried dung of sheep, llamas, and huanacus. This fuel is called *taquia*. It produces a very brisk and intense flame, and most of the mine-owners prefer it to coal. The process of smelting, as practised by the Indians, though extremely rude and imperfect, is nevertheless adapted to local circumstances. All European attempts to improve the system of smelting in these districts have either totally failed, or in their results have proved less effective than the simple Indian method. The Indian furnaces can, moreover, be easily erected in the vicinity of the mines, and when the metal is not very abundant the furnaces may be abandoned without any great sacrifice. For the price of one European furnace the Indians may build more than a dozen, in each of which, notwithstanding the paucity of fuel, a considerably greater quantity of metal may be smelted than in one of European construction." At the village of Yauli, near the mines referred to, situated at an elevation of 13,100 feet above the sea, from twelve to fourteen thousand Indians are congregated together, chiefly engaged in mining, after the fashion handed down to them from generations before the Conquest. Their processes entirely correspond with the imperfect results disclosed by the analysis of native alloys; as well as by the proofs afforded, on the same evidence, that the Peruvian metallurgist was accustomed to work the native copper into his simpler tools and personal ornaments, very much in the same fashion as the ancient mechanician of the

Ohio valley, to whom the processes of smelting and alloying were wholly unknown.

The contrast which the civilisation alike of Mexico and Peru presents, when compared with the highest arts pertaining to any of the tribes of North America, is well calculated to excite surprise and admiration. But the wonder of the Spanish conquerors at their gems and gold, the ready credulity of the missionary priests in their anxiety to magnify the gorgeous paganism which they had overthrown, and the patriotic exaggeration of later chroniclers of native descent, have all tended to overdraw the picture of the beneficent civilized despotism of the Incas of Peru; or the crueller but not less magnificent rule of the Emperors of Mexico. With a willing credulity Spanish historians perpetuated what the Peruvian Garcilasso and the Mexican Ixtlilxochitl related, in their adaptations of native history and traditions to European conceptions. Religious, political, and social analogies to European ideas and institutions, accordingly, strike the modern student with wonder and admiration; nor has the gifted author of the *Conquests of Mexico and Peru* always sufficiently discriminated between the glowing romances begot by an alliance between the barbarous magnificence of a rude native despotism and the associated ideas of European institutions. The metallic treasures of the palaces and the temples of the Incas of Peru are probably not exaggerated; and if so, the precious metals with which they were adorned would have been the index in any European capital of a wealth sufficient to employ the merchant-navies of Venice, Holland, or England in the commerce of the world. But in Peru this was the mere evidence of the abundance of the precious metals in a country where they were as little the representatives of a commercial currency as the feathers of the coraquenque, which were reserved exclusively for

the decoration of royalty. The Peruvians occupied a long extent of sea-coast, but no commercial enterprise tempted them to launch their navies on the Pacific, excepting for the most partial coasting transit. The great mass of the people patiently wrought to produce from their varied tropical climates and fertile soil the agricultural produce on which the entire community depended; resembling in this—as well as in their vast structures wrought by a patiently submissive people at the will of their absolute rulers,—the great oriental despotisms when in their earliest and crudest, yet least licentious forms. Their own traditions traced the dawn of their government no further back than the twelfth century; and the whole characteristics of their very imperfect and unequally developed civilisation confirm the inference that they have not in this respect departed from the invariable tendency of historic myth and tradition to exaggerate the national age. Prescott refers to extensive ruins still existing on the shores of Lake Titicaca, which the Peruvians affirm to have existed before the Incas arrived. But what value can be attached to the traditions of an unlettered people relative to structures or events of any kind dating four or five centuries back? The authority of Bede is held as of little value relative to the Jute or Anglo-Saxon colonization less than three centuries before his time; and the modern New Englander, with deeds and parchments, as well as abundance of printed history to help his tradition, cannot make up his mind as to whether the famous Newport Round Tower was built by a Norse viking of the eleventh century or a New England miller of the seventeenth century. "No account," says Prescott, "assigns to the Inca dynasty more than thirteen princes before the Conquest. But this number is altogether too small to have spread over four hundred years, and would not carry back the foundations

of the monarchy, on any probable computation, beyond two centuries and a half—an antiquity not incredible in itself, and which, it may be remarked, does not precede by more than half a century the alleged foundation of the capital of Mexico." Humboldt, in his *Vues des Cordillères*, indicates the borders of the Lake Titicaca, the district of Callao, and the high plains of Tiahuanaco, as the theatre of ancient American civilisation; and Prescott, in view of the apparently recent origin of the Incas, assumes that they were preceded in Peru by a race advanced in civilisation, which, in conformity with native traditions, he would derive from this same cradle-land of South American civilisation around the deserted shores of Lake Titicaca. Beyond this, however, he does not attempt to penetrate into that unchronicled past. Who this people were, and whence they came, may afford a tempting theme for inquiry to the speculative antiquarian. But it is a land of darkness that lies far beyond the domain of history. The same mists that hang round the origin of the Incas continue to settle on their subsequent annals; and so imperfect were the records employed by the Peruvians, and so confused and contradictory their traditions, that the historian finds no firm footing on which to stand till within a century of the Spanish conquest.

In reality only a very small portion of what is called Peruvian history prior to that conquest can be regarded as anything but a historical romance; and the exaggerated conceptions relative to the completeness and consistent development alike of Peruvian and Mexican native civilisation, are based on the old axiom which has so often misled the archæologist, *ex pede Herculem.*

Viewed, however, without exaggeration, the progress already attained in mechanical skill and artistic ingenuity by both of the semi-civilized American nations, is very

remarkable. The huacas or tombs of the Incas, and also their royal and other depositories of treasure, have disclosed many specimens of curious and elaborate metallurgic skill: bracelets, collars, and other personal ornaments of gold, vases of the same abundant precious metal, and also of silver; mirrors of burnished silver, as well as of a hard and highly-polished stone; finely adjusted balances made in silver; and numerous commoner articles of copper, or of the more useful alloy of copper and tin, of which their tools were chiefly made.

The Peruvian mining operations fully accorded with the partial development of their civilisation in other respects. "Gold," says Prescott, "was gathered by the Incas from the deposits of the streams. They extracted the ore also in considerable quantities from the valley of Curimayo, north-east of Caxamarca, as well as from other places; and the silver mines of Porco, in particular, yielded them considerable returns. Yet they did not attempt to penetrate the bowels of the earth by sinking a shaft, but simply excavated a cavern in the steep sides of the mountain, or at most opened a horizontal vein of moderate depth. They were equally deficient in the knowledge of the best means of detaching the precious metal from the dross with which it was united, and had no idea of the virtues of quicksilver—a mineral not rare in Peru,—as an amalgam to effect this decomposition. Their method of smelting the ore was by means of furnaces built in elevated and exposed situations, where they might be fanned by the strong breezes of the mountains. The subjects of the Incas, in short, with all their patient perseverance, did little more than penetrate below the crust, the outer rind as it were, formed over those golden caverns which lie hidden in the dark depths of the Andes."[1] To the famous Cordillera of the Andes, with

[1] *Conquest of Peru*, book i. chap. v.

its golden treasures, the Peruvians are believed to have given their name of Andes, from the native word *anta*, copper. With this metal they also abound; and while their golden treasures served to enkindle with a useless blaze of barbaric gold their temples and palace-halls, the metallurgic skill which had already taught them to harden the abundant copper with its tin alloy, is the most promising index of their immature civilisation.

But while the arts of civilisation were thus being fostered on that southern plateau of the Andes; apparently in total independence of all that the institutions and the policy of the Incas had achieved, another seat of native American civilisation had been founded on the corresponding plateau of the northern continent, and the Aztecs were building up an empire even more marvellous than that of the Incas. The site of the latter is among the most remarkable of all the scenes consecrated to memories of the birth of civilisation. On the lofty table-land which lies between the Gulf of Mexico and the Pacific Ocean, at an elevation of nearly seven thousand five hundred feet, the valley of Mexico lies engirdled by its ramparts of porphyritic rock, like a vast fortress provided by nature for guarding the infancy of American native civilisation. Here was the scene of the half-mythical heroic age of Toltec Art, where the foundations of all later progress were laid, and architecture achieved its earliest triumphs in the New World on the temples and towers of Tula, the ruined remains of which attracted the attention of the Spaniards at the time of the Conquest. But the history of the Toltecs and their ruined edifices stands on the border lines of romance and fable, like that of the Druid builders of Carnac and Avebury. To them, according to tradition and such historical evidence as is accessible, succeeded their Aztec or Mexican supplanters, along

with the Acolhuans, or Tezcucans, as they were latterly called from their capital Tezcuco. On the opposite shores of the same Mexican lake, the largest of five inland waters that diversified the surface of that great table-land valley, stood Tezcuco and Mexico, the capitals of the two most important states within which the native civilisation of the North American continent developed itself. From the older Toltecans, the encroaching Tezcucans are believed to have derived the germs of that civilisation, which is best known to us in connexion with the true Aztec or Mexican state. Legends of the golden age and heroic races of Anahuac abound, and have been rendered into their least extravagant forms by the patriotic zeal of Ixtlilxochitl, a lineal descendant of the royal line of Tezcuco. But the true Mexicans are acknowledged to be of recent origin, and the founding of Mexico—with rites as rude and primitive as those of the Veneti refugees when inaugurating the Queen of the Adriatic,—is assigned to A.D. 1326. But the founders of Tenochtitlan, as the new capital was called, were a vigorous, enterprising, and ferocious race. The later name of Mexico was derived from the Aztec war-god Mexitli, whose favours to his Aztec votaries enabled them to build up a powerful state by conquest, to enrich themselves with spoil, and to replace the rude fabrics of their city's founders with substantial and ornate structures of stone.

Whatever gloze of mild paternal absolutism may linger around our conceptions of the prehistoric chronicles of Peru, a clearer light illuminates the harsh realities of Mexican sovereignty. The god of war was the supreme deity of the Aztecs, worshipped with hideous rites of blood. Their civil and military codes, according to the narrative of their conquerors, were alike cruel as that of Draco; and their religious worship was a

system of austere fanaticism, and loathsome butchery and cannibalism, which seemed to refine the merciless cruelties of the Red Indian savage into a ritual service fit only for the devil. But besides their hideous war-god, the Mexican mythology was graced by a beneficent divinity, Quetzalcoatl, the instructor of the Aztecs in the use of metals, in agriculture, and in the arts of government. This and similar elements of Mexican mythology have been regarded by Prescott and others as the traces of a milder faith inherited by the Mexicans from their Toltecan predecessors, and on which they engrafted their own incongruous creed of unmitigated ferocity. This idea is one supported by many probabilities, as well as by some evidence. The early history of the Northmen, however, in which we witness the blending of that rich poetic fancy wherein lay the germ of later Norman romance and chivalry, with cruelties pertaining to a creed little less bloody than that of the Mexican warrior, shows that no such theory is needed to account for the incongruities of the religious system of the Aztecs. In truth, the ferocity of a semi-barbarous people is often nothing more than its perverted excess of energy; and—as has been already noted in reference to the Caribs,—is more easily dealt with, and turned into healthful and beneficent action, than the cowardly craft of the docile slave. It is only when such hideous rites are consciously engrafted on the usages of a people already far in advance of such a semi-barbarous childhood—as in the Spanish adoption of the Inquisition at the commencement of its modern history,—that they prove utterly baneful, because the nation is already past that stage of progress in which it would naturally outgrow them.

Hideous, therefore, as were the human sacrifices, with their annual thousands of victims, the offerings of in-

fants to propitiate Tlaloc, their rain-god, and the loathsome banquets on the bodies of their sacrificed victims,—if indeed this be not an exaggeration of Spanish credulity and fanaticism,—it is nevertheless difficult to concur in the verdict of the gifted historian of *The Conquest of Mexico*, that "it was beneficently ordered by Providence that the land should be delivered over to another race who would rescue it from the brutish superstitions that daily extended wider and wider, with extent of empire." The rule of the conquerors, with their Dominican ministers of religion, was no beneficent sway; and its fruits in later times have not proved of such value as to reconcile the student of that strange old native civilisation of the votaries of Quetzalcoatl, to its abrupt arrestment at a stage which can only be paralleled by the earliest centuries of Egyptian progress.

Both mining operations and metallurgic arts were carried further by the Mexicans than by the Peruvians. Silver, lead, and tin were obtained from the mines of Tasco, and copper was wrought in the mountains of Zacotollan, by means of galleries and shafts opened with persevering toil where the metallic veins were embedded in the solid rock; and there, as at the Lake Superior copper regions, the traces of such ancient mining have proved the best guides to the modern searchers for the ores. The arts of casting, engraving, chasing, and carving in metal were all practised with great skill. Vessels both of gold and silver were wrought of enormous size: so large, it is said, that a man could not encircle them with his arms; and the abundant gold was as lavishly employed in Mexico as in Peru, in the gorgeous adornment of temples and palaces. Ingenious toys, birds and beasts with movable wings and limbs, fish with alternate scales of silver and gold, and personal ornaments

in great variety, were wrought by the Mexican goldsmiths of the same precious metal, with such curious art, that the Spaniards acknowledged the superiority of the native workmanship over anything they could achieve. When Cortes first entered the capital of Montezuma in 1519, the Mexican Emperor received him in the palace built by his father Axayacatl, and hung round his neck a decoration of the finest Mexican workmanship. The shell of a species of craw-fish, set in gold, formed the centre, and massive links of gold completed the collar, from which depended eight ornaments of the same metal, and of delicate workmanship, wrought in imitation of the prized shell-fish.

The arts thus practised on the great plateau extended to the most southern limits of the North American continent. The huacas, or ancient graves of the Isthmus of Panama, have been ransacked by thousands in recent years, from the temptation which the gold relics they contain held out to their explorers. These include representations of beasts, birds, and fishes, frogs, and other objects, imitated from nature, often with great skill and ingenuity. One gold frog which I examined had the eyes hollow, with an oval slit in front, and within each a detached ball of gold, which appeared to have been executed in a single casting. This insertion of detached balls is frequently met with in the pottery, as well as in the goldsmith's work of the Isthmus, and is singularly characteristic of a peculiar phase of local art. Human figures are also found in the same graves wrought in gold; but, so far as my own opportunities of observation enable me to judge, of inferior imitative skill and execution to the representations of other animate subjects. But they display abundant metallurgic art. Soldering as well as casting was known to the ancient goldsmith, and the finer specimens have been finished

with the hammer and graving-tool. Judging from the condition of the human remains found in those huacas of the peninsula, they are probably of a much higher antiquity than the era of Mexican civilisation, and illustrate the source of later Aztec arts.

But while the Mexicans wrought their ingenious toys, and lavished their inexhaustible resources of gold and silver in personal decoration, and adorned their public edifices with scarcely less boundless profusion than the Peruvians, they had learned to some extent the practical value of gold and other metals as a convenient currency. By means of this equivalent for the gold and silver coinage of Europe, the interchange of commodities in the great markets of Mexico was facilitated, and an important step in the progress towards a higher stage of civilisation secured. This metallic currency consisted of pieces of tin cut in the form of a T, or stamped with a similar character, and of transparent quills filled with gold dust. These were apparently regulated to a common standard by their size: for the use of scales and weights, with which the Peruvians were familiar, appears to have been totally unknown in Mexico.

The nature of the Mexican metallic currency fully accords with the knowledge and experience of a people among whom the metallurgic arts were of comparatively recent origin. The easily fused tin, and the attractive and accessible gold-dust, supplied the ready materials for schooling an ingenious people in the use of the metals. Copper was probably first used when found in a pure metallic state, as among the old miners of Lake Superior, while the art of fusing, taught by the Aztec Tubal-Cain, was tried only on the readily-yielding tin. By this means the arts of smelting and moulding the metallic ores would be acquired, and applied to copper, silver, and gold, as well as to the tin. Accident might

suggest the next important stage of metallic alloys; but under the circumstances alike of Peruvian and Mexican civilisation, progressing in regions abounding with the most attractive and easily-wrought metals, it is easy to conceive of the independent discovery of the useful bronze alloy. Yet by the standard composition of their bronze, far more than the ingenious intricacy of their personal ornaments, utensils, and architectural decorations, may fairly be tested the actual progress alike of the Incas or of the Aztecs. The delight of the savage in personal adornment precedes even the most needful covering of his nakedness, and the same propensity long monopolizes the whole inventive ingenuity of a semi-barbarous people; while the useful tools of bronze embody the true germs of incipient civilisation. Tested by such a standard, the metallurgic arts of Peru furnish conclusive evidence of its very partial development, and suggest the probability that its latest stage did not pertain to any period very remote from the era of European discovery. The alloy of copper and tin, when destined for practical use in the manufacture of weapons and implements, is found to possess the most serviceable qualities when composed of about ninety per cent. of copper to ten of tin; and so near is the approximation to this theoretical standard among the bronze relics of the ancient world, that the archæologists of Europe have been divided in opinion as to whether they should assume a Phœnician or other common origin for all the weapons, implements, and personal ornaments of that metal found more or less abundantly over the whole continent; or that the mixed metal was all derived from a common centre, and that this was manufactured in the various countries of Europe into the objects of diverse form and pattern abounding in their soil, and deposited

among the sepulchral offerings which their barrows and tumuli reveal. That the former idea of a common origin for the finished implements is untenable, has been proved, alike by numerous discoveries of moulds of the prepared metal, and even of the furnaces where the bronze worker practised his ingenious art; and also by the varieties in form and style of ornament, by which the bronze relics of difierent countries of Europe, manifestly belonging to the same period, are distinguishable. The idea of the bronze itself having been all derived from some common source is, in like manner, rendered improbable by a more careful investigation of the evidence on which it has been founded. Mr. Worsaae, the distinguished Danish antiquary, after commenting on the resemblance traceable throughout the many weapons, implements, and personal ornaments of bronze, which have been discovered in Greece, Italy, Germany, France, England, and Scandinavia, adds, "They have all been cast in moulds, and the metal is of the same composition, nine tenths copper, and one tenth tin. From this there would be further reason to suppose that they all originated with one people. But a careful examination and comparison of the antiquities themselves from these various countries will nevertheless show that in different countries the antiquities of bronze are also somewhat different." This he proceeds to illustrate from a comparison of their forms, patterns, ornaments, and practical details; and he accordingly arrives at the conclusion, "beyond a doubt, that such bronze objects were manufactured in those countries, and not imported. The only thing which was imported being of course the metal, which by trade and barter was spread, in different ways, over the whole of Europe."[1] In an earlier part of the

[1] *Primeval Antiquities of Denmark*, pp. 137, 138.

same work, Mr. Worsaae refers to the additional evidence supplied by numerous discoveries of moulds, pieces of unwrought metal, collections of broken weapons, tools, and ornaments prepared for smelting, and the fragments of bronze derived from the metal running into the joints of the mould, and subsequently detached in the process of finishing, which are technically called "castings." From all such evidence it is assumed that the acquisition of weapons and implements of metal was speedily followed throughout all the countries of Europe by the knowledge and practice of metallurgic arts. Mr. Worsaae, however, only supposes the latter to have extended to the amount of skill requisite for melting and moulding the useful alloy; and not to the knowledge required for determining the most useful combinations of copper and tin. Referring to the Scandinavian antiquities of gold, as well as of bronze, he remarks: "These metals might easily have been introduced, in the rude state, either from Russia, from the Ural mountains, or from England, where, as is well known, tin and copper, the constituents of bronze, occur in considerable quantities, and where gold may have been found in ancient times: while we may account for its presence here either by supposing that the transit took place direct by sea, or that the metal was first transmitted to countries nearer England, and thence by barter was brought to the north. This fact, at least, is evident, that almost all bronzes which are referable to that primeval time, when iron was not generally known or employed, are formed of a peculiar mixture of metals, which is constantly the same in all the countries in which they are found. It contains, for instance, about nine tenths of copper and one tenth of tin, while the more modern bronze which, subsequent to the knowledge of iron, was used for ornaments, vessels, and

the like, was usually formed of equal quantities of copper and zinc. Hence it is highly probable that the ancient bronze formed of copper and tin, was diffused from one spot over the whole of Europe." This spot he supposes to be England, famed for its rich mines of copper and tin from the earliest historic times. But while it is improbable that the tin and copper were separately imported into each country of Europe, to be there converted by the native metallurgist into the more useful alloy; a more careful investigation of the evidence throws as much doubt on the idea of any single common source for the bronze, as for the objects of varied form and pattern made from that alloy.

The reasons for some general approximation to a constant proportion in the elements of European bronze, when designed for tools and weapons, have been well illustrated by the report of a series of synthetic experiments of Dr. George Pearson, communicated by him to the Royal Society of London in 1796, and printed in the *Philosophical Transactions* of that year. Having by a series of analyses determined the relative proportions of copper, tin, and other metals present in various Roman and British bronze relics, he next proceeded to fuse copper and tin in various united proportions, beginning with one part of tin to twenty parts of copper, which produced a dark-coloured bronze, with a fracture inclining in its colour to the peculiar red of the pure copper. On reducing the copper to fifteen parts of copper to one of tin, the colour was materially affected, and the red copper hue was no longer seen when the product was fractured, but an alloy of greater strength was produced. The experiments were continued with twelve, ten, nine, eight, and seven parts of copper to one of tin; and when the last fusion of the metals was

tested, the increase in hardness and brittleness became very apparent. The same characteristics were still more marked on successively reducing the proportions of copper to seven, six, five, four, and three; and when an alloy was made of two parts of copper to one of tin, it was, according to Dr. Pearson's report, as brittle as glass. Here, then, we see at a glance the whole process pursued by the old worker in bronze, who having ascertained that he could produce a harder and more useful compound than the pure copper by alloying it with tin, would not fail to diminish the proportions of the latter till he had obtained a sufficiently near approximation to the well ascertained admixture of the best bronze, to answer the practical purposes for which it was designed. Accordingly, without any great nicety of apportionment of the two metals, it is obvious that no intercourse or interchange of experience was necessary to lead the isolated metallurgists of the remotest regions of Europe to the same results when dealing with these metals with similar objects in view; nor would a closer correspondence between the proportionate ingredients of the native American and European bronze than has yet been detected, indicate more than similar aims, and the inevitable experience consequent on the properties of the varying alloy, leading to corresponding results. The following table of the compositions detected by analyses in various ancient bronze relics will suffice to show how little foundation there is for the assumption of a Phœnician, British, or any other common origin for the alloy of which they were made.

ANALYSES OF ANCIENT BRONZES.

No.			Copper.	Tin.	Lead.	Iron.
1.	Lituus,	Lincolnshire,	88·	12·		
2.	Anglo-Roman patella,	,,	86·	14·		
3.	Spear-head,	,,	86·	14·		
4.	Scabbard (Danish?),	,,	90·	10·		
5.	Axe-head,	Ireland,	91·	9·		
6.	Axe palstave,	Cumberland,	91·	9·		
7.	Axe-head,	,,	88·	12·		
8.	Bronze vessel,	Cambridgeshire,	88·	12·		
9.	Sword,	France,	87·47	12·53		
10.	Caldron,	Berwickshire,	92·89	5·15	1·78	
11.	Sword,	Duddingstone,	88·51	9·30	2·30	
12.	Kettle,	Berwickshire,	88·22	5·63	5·88	
13.	Axe-head,	Mid-Lothian,	88·5	11·12	0·78	
14.	Caldron,	Duddingstone,	84·8	7·19	8·53	
15.	Palstave,	Fifeshire,	81·19	18·31	0·75	
16.	Sword,	Ireland,	88·63	8·54	2·83	
17.	Sword,	,,	83·50	5·15	8·35	3·
18.	Sword,	Thames,	89·69	9·58	...	0·33
19.	Sword,	Ireland,	85·62	10·02	...	0·44
20.	Celt,	,,	90·68	7·43	1·28	...
21.	Axe-head,	,,	90·18	9·81	...	...
22.	Axe-head,	,,	89·33	9·19	...	0·33
23.	Celt,	,,	83·61	10·79	3·20	0·58
24.	Celt,	King's Co., Ireland	85·23	13·11	1·14	...
25.	Drinking-horn,	,, ,,	79·34	10·87	9·11	...
26.	Bronze vessel,	Ireland,	88·	12·	...	...
27.	Wedge,	,,	94·	5·9	...	0·1

Nos. 1-7. Dr. G. Pearson, F.R.S., *Philosoph. Trans.*, 1796.
8. Professor Clarke, M.D. Cantab., *Archæologia*, xviii. p. 348.
9. Mongez, *Mém. de l'Institut.*
10-15. George Wilson, M.D., *Prehist. Ann. Scot.*, p. 246.
16, 17. Professor Davy, *Prehist. Ann. Scot.*, p. 247.
18-23. J. A. Philips, F.G.S., *Mem. Chem. Soc.*, iv. p. 288.
24, 25. Dr. Donovan, *Chem. Gazette*, 1850, p. 176.
26, 27. Dr. J. H. Gibbon, U.S. Mint.

From the varied results which so many independent analyses disclose, ranging as they do from 79 to 94 per cent. of copper, or more than the whole amount of the supposed constant ratio of tin; besides the variations in the nature, as well as in the quantity of the other ingredients, it is abundantly obvious that no greater uniformity is traceable, than such as might be expected to result from the experience of isolated and independent

metallurgists, very partially acquainted with the chemical properties of the standard alloy, and guided for the most part by the practical experience derived from successive results of their manufacture.

When destined for other uses than such tools and weapons as those already referred to, the composition of bronze is considerably varied. The bronze of French cannons is composed of 100 copper to 11 tin, while for bell-metal it is only 80 per cent. of copper, to tin 10, zinc 5·6, lead 4·4; and for speculum metal, where a hard alloy, susceptible of the finest polish, is desirable, while its extreme brittleness is of no moment, the copper is reduced to about 66 per cent. to 34 of tin.

We thus perceive how the various exigencies of the metallurgist, under the control of a very ordinary amount of practical skill, would gradually lead him to discover the best proportions for his useful alloy; though it would only be after the protracted accumulation of many fruits of isolated experiment, and the development of that combined experience which specially pertains to an advanced condition of civilisation, that anything more than some crude approximation to the best composition of the alloy would be determined. Hence the value of analytical evidence in determining the degree of civilisation of Mexico and Peru, as indicated by their metallurgic arts. For the general requirements of a tool, or weapon of war, where a sufficient hardness must be obtained, without any great liability to fracture, accumulated experience determined the best proportions to be about 90 per cent. of copper to 10 of tin; or with a small proportion of lead in lieu of part of the tin, which further experience taught the primitive worker in bronze communicated to his cutting instrument a greater degree of toughness, and consequently diminished its liability to fracture. But where great hard-

ness was the chief requisite, as in certain engraving, carving, and gem-cutting tools, then the mere increase of the proportion of tin in the alloy supplied the requisite quality, until, carried to excess, the metallurgist was warned of his error by the excessive brittleness of the product. In this, I doubt not, lies the whole secret of Mexican and Peruvian metallurgy which has seemed so mysterious, and therefore so marvellous to the most sagacious inquirers. "It is worthy of remark," says Prescott, "that the Egyptians, the Mexicans, and the Peruvians, in their progress towards civilisation, should never have detected the use of iron, which lay around them in abundance, and that they should each, without any knowledge of the other, have found a substitute for it in such a curious composition of metals as gave their tools almost the temper of steel; a secret that has been lost, or, to speak more correctly, has never been discovered by the civilized European."[1] Bearing in remembrance the synthetic results already referred to, the following table will supply a partial contribution towards the requisite data for testing the skill of the native American metallurgist.

ANALYSES OF ANCIENT AMERICAN BRONZES.

No.		Copper.	Tin.	Iron.
1.	Chisel from silver mines, Cuzco,	94·	6·	
2.	Chisel from Cuzco, . . .	92·385	7·615	
3.	Knife from grave, Atacama, .	97·87	2·13	
4.	Knife „ „ .	96·	4·	
5.	Crowbar from Chili, . .	92·385	7·615	
6.	Knife from Amaro, . .	95·664	3·965	0·371
7.	Perforated axe, . . .	96·	4.	
8.	Personal ornament, Truigilla, .	95·440	4·560	
9.	Bodkin from female grave, do.,	96·70	3·30	

Nos. 1. Humboldt.
2. Dr. J. H. Gibbon.
3, 4. J. H. Blake, Esq.
5. Dr. T. C. Jackson.
6, 7. Dr. H. Croft.
8, 9. T. Ewbank, Esq.

[1] Prescott's *Conquest of Peru*, book i. chap. v.

The comparison of this with the previous table indicates a smaller amount of tin in the American bronze than in that of ancient Europe. For some Egyptian spear-heads Gmelin gives, copper 77·60, tin 22·02; and ancient weapons, armour, vessels, and coins, indicate such varied proportions as imply the results of experience in adapting the alloy for the specific purpose in view. A much larger number of analyses would be desirable as the data from which to generalize on the metallurgic skill developed independently by a native American civilisation; but the examples adduced here are sufficient to show that there is no lost secret for Europe to discover. The native metallurgist had learned the wonderful art of alloying his soft and ductile copper with the still softer tin, and producing by their chemical admixture a harder, tougher metal than either. But he does not appear to have carried his art so far as to ascertain the most efficient proportions of the combining metals, or even to have made any very definite approximation to a fixed rule, further than to use with great moderation the alloying tin. He had discovered, but not entirely mastered, a wonderful secret, such as in the ancient world had proved to lie on the threshold of all other and higher truths in mechanical arts. He was undoubtedly advancing, slowly but surely, on the direct course of national elevation; and the centuries which have followed since the conquests of Cortes and Pizarro might have witnessed in the New World triumphs not less marvellous in the progress of civilisation than those which distinguish the England of Victoria from that of the first Tudors. But it was otherwise decreed. The conquests of native science and art were abruptly arrested by the Spanish conquistadors, and it is difficult to realize the conviction that either Mexico or Peru has gained any equivalent for the irreparable loss which thus debarred us from the solution

of some of the most profoundly interesting problems connected with the progress of the human race. Amid all the exclusiveness of China, and the isolation of Japan, there is still an unknown quantity among the elements of their civilisation derived from the same sources as our own. But the America of the fifteenth and sixteenth centuries was literally another world, guarded almost as securely from external and foreign influences as the planets that move around us in their fixed orbits, members of the same solar system with ourselves.

CHAPTER X.

THE ARCHITECTURAL INSTINCT: EARTHWORKS.

THE labours of a zealous and indefatigable phalanx of American archæologists have accumulated a valuable amount of materials illustrative of the history of primeval architecture, as it exists in the form of earthworks over a wide extent of the New World. Notwithstanding some fine mountain ranges which diversify the landscape, the general character of the United States presents, in its great levels and gentle undulating contour, a singular contrast to the physical aspects of the European continent; and to this natural character of its scenery may be ascribed the multiplication of those earth-pyramids which have suggested the designation of the Mound-Builders, applied to its ancient population. The great pyramid of Suphis transferred from its original site, with the far-receding horizontal plain, to an Italian or Swiss valley, backed by the lofty Apennines or the towering peaks of the Alps, would appear as incongruous and insignificant as Silbury Hill under the shadow of Ben Nevis, or the Great Mound at Miamisburg, Ohio, among the green mountains of Vermont. An instinctive perception of the harmonies of nature and art guides all primitive builders in the development of native architecture. It is only in such a strange artificial condition of exotic social life as that which now pervades the ancient sites of the Mound-Builders, that the Egyptian

propylæum, the Greek temple, and the Gothic cathedral, are adopted at random, and without a sense of incongruity, either in relation to the climate or their special fitness: alike for churches, courts of justice, hospitals, or criminal strongholds.

The question as to whether the pyramidal earthworks of the Mound-Builders originated among the native aboriginal occupants of the great river-valleys of North America, or are only ruder reproductions of an architecture which had its birth in tropical Mexico, under the shadow of the Andes, may have a considerable influence on the decision of very important questions relating to primitive American ethnology. Under any circumstances, however, the physical geography of a country necessarily exercises an important influence on its history; and the singular aspect of the widely-extended region throughout which the earthworks have been traced, is a feature of no slight importance in its bearing on our present inquiries. In one of a series of contributions to the physical geography of the United States, Mr. Charles Ellet has specially investigated the Mississippi Valley, with a view to the facilities which its natural advantages and capabilities afford for modern enterprise.[1] Looking to the general features of the country between the Great Lakes and the Gulf of Mexico, and extending from the Atlantic to the Rocky Mountains, he describes it as a great plain inclining gently towards the east, along which flow all the streams that enter the Lower Mississippi and the Gulf of Mexico, from the west. Another plain, of nearly equal extent, and corresponding inclination, descends from the north, along which flow the northern tributaries of the Ohio and the Mississippi itself, until it

[1] "Of the Physical Geography of the Mississippi Valley, with Suggestions for the Improvement of the Navigation of the Ohio and other rivers," by C. Ellet, Jun., C.E. *Smithsonian Contributions*, vol. ii.

unites with the great Missouri, pursuing the irregular line which marks the intersection of those vast surfaces; while another plain, descending from the summit of the Alleghany range, is drained by the waters of the Cumberland and Tennessee, and all the southern tributaries of the Ohio, and intersects the great plain from the north in the valley of the Ohio, and the great plain from the west in the valley of the Lower Mississippi. After further noting the spread of another of those great plains from the Alleghany mountains to the Atlantic coast, Mr. Ellet adds: "The word *plain* is adopted here for the convenience of description only, and is not to be received in a literal sense. These great surfaces are furrowed by valleys, and relieved in places by hills and even mountains; yet these mountains are of inconsiderable extent compared with the vast area of the regions described, and rest upon the great slopes which descend from the dividing ranges." Along the great levels drained by the numerous tributaries of the river-system of this wide champaign, the ancient traces of America's allophylian population abound; and especially on the banks of the Ohio and its tributaries have the most remarkable monuments been brought to light. The capabilities of this region for modern settlement and the abundant development of a comprehensive commercial enterprise, are the same which made it anciently the resort of a numerous settled population. "In tracing the Ohio to its source," Mr. Ellet remarks, "we must regard the Alleghany as its proper continuation. This noble tributary rises on the borders of Lake Erie, at an average elevation of 1300 feet above the surface of the sea, and nearly 700 feet above the level of the lake. The plain along which this river flows is connected with no mountain range at its northern extremity, but continues its rise, with great uniformity, from the mouth of the Ohio to the brim of

the basin which encloses Lake Erie. The sources of the tributary streams are generally diminutive ponds, distributed along the edge of the basin of Lake Erie, but far above its surface, and so slightly separated from it that they may all be drained with little labour down the steep slope into that inland sea. From these remote sources a boat may start with sufficient water, within seven miles of Lake Erie, in sight sometimes of the sails which whiten the approach to the harbour of Buffalo, and float securely down the Connewango, or Cassadaga, to the Alleghany, down the Alleghany to the Ohio, and thence uninterruptedly to the Gulf of Mexico. In all this distance of 2400 miles, the descent is so uniform and gentle, so little accelerated by rapids, that when there is sufficient water to float the vessel, and sufficient power to govern it, the downward voyage may be performed without difficulty or danger in the channels as they were formed by nature; and a return trip might be made with equal security and success, with very little aid from art." Here, therefore, is one of the great modern centres towards which population, agricultural enterprise, commerce, and wealth, all flow; and it is a subject of lively interest to investigate the traces which disclose to us the proof that this vast area is not now, for the first time, being rescued from the primeval forest, with its wild fauna, and still wilder savage man; but that here, in older centuries, busy industry, ingenious arts, and civic and military enterprise, made it the scene of stirring events that only wanted their Homer or Herodotus to make the epos of the Ohio more interesting for us than the legends of the Scamander or the mythic traditions of the Nile.

In a great level country such as that drained by the Ohio and its tributaries, and attracting its multiplying population to the broad alluvial terraces overlooking its smoothly-flowing rivers, it was natural that the building

instinct of man should first employ itself on earthworks, and that the monumental grave-mound, dedicated to the patriarchal leader or sovereign chief, like the architecture of the primeval builder on the plain of Shinar, should be a pyramid "whose top may reach unto heaven." The great mound of Miamisburg, Ohio, is sixty-eight feet high, and eight hundred and fifty-two feet in circumference at its base. The more famous Grave Creek Mound of Virginia rises to a height of seventy feet, and measures at its base one thousand feet in circumference. Other and still larger earthworks have been noted, such as the truncated pyramid at Cahokia, Illinois, which occupies an area upwards of two thousand feet in circumference, and rears its level summit, of several acres in extent, to a height of ninety feet. But this last probably belongs to a different class: an earth-pyramid, but not a sepulchral monument; resembling in this respect the still greater British earth-pyramid of Silbury Hill, characteristically reared, remote from the mountain ranges of Scotland or Wales, on the level downs of Wiltshire, where it towers to a height of one hundred and seventy feet, and covers an area of more than five acres of land. Recent explorations seem to establish beyond doubt that that great English earthwork is not a sepulchral mound, like the earth-pyramids of the American Mound-Builders, and as such therefore, the latter are probably among the most gigantic memorials of their class in the world. "We have seen mounds," remarks Flint, an American topographer, with a just appreciation of the relation of these earthworks to the features of the surrounding landscape, "which would require the labour of a thousand men employed on our canals, with all their mechanical aids, and the improved implements of their labour, for months. We have more than once hesitated in view of one of those

prodigious mounds, whether it were not really a natural hill. But they are uniformly so placed, in reference to the adjacent country, and their conformation is so unique and similar, that no eye hesitates long in referring them to the class of artificial erections." The exploration of more than one of these huge earth-pyramids has entirely set at rest any doubts as to their artificial origin, and has, moreover, disclosed the fact that they are monumental structures erected to preserve the memory of the honoured dead in ages utterly forgotten, and by a race of which they preserve apparently the sole remaining vestiges.

The earthworks and architectural constructions of the Mound-Builders are by no means limited to the class of mounds already referred to, and from which their characteristic name is derived. They are exceedingly varied; and extending as they do over a geographical area of wide extent, and embracing considerable diversity of climate, they include many other structures besides those of a sepulchral character; and disclose special features of peculiar interest belonging to particular localities. The original limits assigned to them by Messrs. Squier and Davis embraced the entire basin of the Mississippi and its tributaries, from the shores of the great lakes to the Gulf of Mexico, comprehending alike the fertile plains along the Gulf, and the whole northern territory, including the sources of the Alleghany in the western part of the State of New York. Since the "Ancient Monuments of the Mississippi Valley" appeared, as the first of the *Smithsonian Contributions to Knowledge*, Mr. Squier has completed a minute series of surveys and explorations of the aboriginal monuments of the State of New York, the result of which has been to lead him entirely to dissociate the rude and comparatively slight earthworks of that northern region from the remarkable

ancient monuments previously explored and illustrated by him. Rejecting theory, he has, with honest and painstaking zeal, carefully investigated the evidence which previously depended on loose, and, as it appears, exaggerated accounts, and he thus sums up the results: "In full view of the facts, I am driven to a conclusion little anticipated when I started upon my trip of exploration, that the earthworks of western New York were erected by the Iroquois, or their western neighbours, and do not possess an antiquity going very far back of the discovery." Already the plough is fast obliterating every trace of those memorial mounds and defensive works of the frontier tribes, slight and ephemeral as their savage builders; but the convictions forced on the mind of their explorer by a personal survey, have not altered his views relative to the great earthworks previously described by him; or tempted him, as they have some other writers, to confound these lasting evidences of the combined operations of a numerous settled population, with the traces of the slight and simple defences and other earthworks of the modern Indians. He accordingly sums up his observation by remarking that "the ancient remains of western New York, except so far as they throw light upon the system of defence practised by the aboriginal inhabitants, and tend to show that they were to a degree fixed and agricultural in their habits, have slight bearing upon the grand ethnological and archæological questions involved in the ante-Columbian history of the continent."

The people by whom the great earthworks of the Mississippi Valley were constructed, and its remarkable defensive enclosures erected and maintained, must have been in a condition greatly different from the forest tribes of the seventeenth and eighteenth centuries. Nevertheless, though gathered at many favourite points,

in large communities, they were probably isolated by extensive tracts of dense forests from the country lying beyond the river-systems in which they were settled. The earthworks of the Mound-Builders are of very diverse character, and partake in some respects of the local aspect of their sites; but they chiefly abound where the widely extended alluvial flats furnish the most fertile tracts for cultivation; and it has been justly noted as worthy of special remark that the sites selected for settlements, towns, and cities by the modern supplanters of the Red Indian, are often those which were the special favourites of the Mound-Builders, and the seats of their densest population. Such can rarely be said of the Indian settlement, which owes the selection of its site to the convenience of the hunter, and loses all its original attractions when the axe of the settler dissipates the charm. The country lying remote from the larger tributaries of the Mississippi and its main branches, was probably in the era of the Mound-Builders, as in later times, covered with the primeval forest, and tenanted by the abundant game of the hunter; while on the outlying regions, or beyond the great Lakes and the Rocky Mountains, perchance the progenitors of the modern Indian tribes lurked: like the barbarians of antechristian Europe, who, beyond the Rhine and the Baltic, nursed the future spoilers of Rome, and the builders-up of modern Europe out of the ruined empire of the Cæsars.

The fertile valley of the Scioto appears to have been one of the seats of densest population, as indicated by the numerous ancient works which diversify its surface. Corresponding evidence preserves the traces of an equally dense population in the Miamis Valley; and throughout the State of Ohio the mounds and earthworks of various kinds are estimated at between eleven and twelve

thousand. They are stated to be scarcely less numerous on the Kenhawas in Virginia than on the Scioto and Miamis, and are abundant on the White River and Wabash, as also upon the Kentucky, Cumberland, Tennessee, and the numerous other tributaries of the Ohio and Mississippi. Works accumulated in such numbers, and, including many of great magnitude, elaborateness of design, and executed by the combined labour of large bodies of workmen, afford indisputable evidence of the presence, through a greatly protracted period, of a settled and industrious population. Beyond these carefully explored regions, traces of other ancient structures have been observed at widely separated points, though caution must be exercised in generalizing from data furnished by casual and inexperienced observers. All primitive earthworks, whether for defence, sepulchral memorials, or religious rites, have certain features in common; and the tendency of the popular mind is rather to exaggerate chance resemblances into forced analogies and parallels, than to exercise any critical discrimination. Including, however, all the larger earthworks, essentially dissimilar from the slighter and ruder traces of modern Indian workmanship, they appear to stretch away from the upper waters of the Ohio to the westward of Lake Erie, and thence along Lake Michigan, nearly to the Copper Regions of Lake Superior. Through Wisconsin, Iowa, and the Nebraska Territory, they have been traced extending towards the Rocky Mountains; while on the south their area is bounded by the shores of the Gulf of Florida and the Mexican territory, where they seem gradually to lose their distinctive character, and pass into the great teocallis of a higher developed Mexican architecture. Their affinities are indeed more southern than northern. They are scarcely, if at all, to be found to the eastward of the watershed between the

Mississippi and the Atlantic, in the States of Pennsylvania, New York, or Virginia; and they have been rightly designated, from their chief site, the Ancient Monuments of the Mississippi Valley, including in this its tributaries, and especially the valley of the Ohio. There their localities fully accord with those which, in the primitive history of the Old World, reveal the most abundant traces of an aboriginal population, in their occupation of the broad alluvial terraces, or "river bottoms," as they are styled. To the north, however, though the memorials of an ancient population are no less striking, they are of a different character; and the earthworks in the vicinity of the Great Lakes must be classed by themselves, as indicating customs and rites distinct from those pertaining to the ancient population of the south.

The remarkable works thus traceable over so large an extent of the North American continent have been so carefully explored, and so minutely described, especially by Messrs. Squier and Davis, and Mr. J. A. Lapham, in the valuable archæological monographs printed in the *Smithsonian Contributions to Knowledge*, that little more is needed for our present purpose than to refer to one or two characteristic types of each of the different classifications under which they have been grouped. They admit of being primarily arranged into the two obvious subdivisions of ENCLOSURES and MOUNDS, and these again embrace a variety of works diverse in form, and evidently designed for very different uses. Under the first of these heads are included the fortifications or strongholds; the sacred enclosures, destined, as is assumed, for religious rites; and numerous miscellaneous works of the same class, generally symmetrical in structure, but the probable use of which it is difficult to determine. The second subdivision embraces the true

mound-buildings, including what have been designated sacrificial mounds, temple mounds, sepulchral mounds, animal mounds, and also various others of diverse characters and uncertain purpose. All, however, partake of characteristics specially pertaining to a broad, level country; but this is nowhere so strikingly apparent as where mounds appear to have been purposely erected as observatories and points of sight from whence to survey the works elaborated on a gigantic scale on the level plain. In addition to the striking features which the external aspect of those ancient memorials exhibits: wherever they have been excavated many interesting relics of the ancient builders have been disclosed, adding new and minutely graphic illustrations of their social condition, and the artistic and industrial arts of the remote period to which they pertain.

The British hill-forts, the remarkable vitrified forts of Scotland, and the larger strongholds of the British aborigines, such as the ingenious circumvallations of the White Caterthun overlooking the Scottish valley of Strathmore, all derive their peculiar character from the mountainous features of the country; while on the low grounds, under the shadow of the Ochils, the elaborate earthworks of the Camp of Ardoch show the strikingly contrasting castrametation of the Roman invaders. The ancient military encampments or raths of Ireland, which abound in the level districts of that country, as well as on heights where stone is not readily accessible, also furnish highly interesting illustrations of earthworks with a special character derived from the features of their localities. An earthen *dune* or *rath*, as in the celebrated Rath Keltair at Downpatrick, occupies a commanding site, where it is strongly entrenched, with a considerable space of ground enclosed within its outworks. But neither the Scottish White Caterthun, nor the Irish

Rath Keltair, or even the Rath Righ of Tara Hill, can compare with the remarkable American strongholds of Fort Hill, Ohio, or Fort Ancient on the little Miami River, in the same State. The celebrated Hill of Tara, in the county of Meath, has ceased, according to tradition, to be the chief seat of the Irish kings, since its desertion in the latter part of the sixth century, shortly after the death of Dermot, the son of Fergus. It appears to have been the site of a fortified city; and now, after the devastations of thirteen centuries, its raths and dunes, circumvallations and trenches, present many interesting points of comparison with the more extensive earthworks of the Mississippi valley.

The valley of the Mississippi is a vast sedimentary basin extending from the Alleghanies to the ranges of the Rocky Mountains. Through this the great river and its numerous tributaries have made their way for countless ages, working out shallow depressions in the alluvial plain, on which are recorded the chronicles of successive epochs of change in the broad terraces that mark the deserted levels of ancient channels. The edges of these table-lands bordering on the valleys are indented by numerous ravines, and the junctions of many lesser streams with the rivers have formed nearly detached peninsulas, or in some cases tracts of considerable elevation insulated from the original table-land. Many of those bluff headlands, peninsulas, and isolated hills with level summits of considerable extent, presented all the requisite adaptations for the site of native strongholds on the river skirts of those fertile table-lands, where so many traces of the presence of an ancient population abound. These points have, accordingly, been fortified with great labour and skill. Embankments and ditches enclose the whole space, varying in strength according to the natural resources of the ground. The approaches are

guarded by trenches and over-lapping walls, more or less numerous in different forts; and have occasionally a mound alongside of the other defences of the approach, but rising above the rest of the works, as if designed both for out-look and additional defence. In some few cases the walls of these enclosures are of stone, but if they were ever characterized by any attempt at regular masonry all traces of it have disappeared, and there seems little reason for supposing that such walls differed in essential character from the earthworks. No cement was used, and in all probability we have in these only heaps of stones instead of earth-banks, owing to special local facilities which led to the substitution of the one for the other.

One of the simplest, but most extensive of those primitive strongholds, is Fort Hill, Ohio, surveyed and described by Messrs. Squier and Davis. The defences occupy the summit of a detached hill, elevated about five hundred feet above the bed of Bush Creek, which flows round two sides of it, close to its precipitous slope. Along the whole edge of the hill a deep ditch has been cut, and the materials taken from it have been piled up into an embankment, varying in height above the bottom of the ditch, from six to fifteen feet. In its whole extent the wall measures eight thousand two hundred and twenty-four feet, or upwards of a mile and a half in length, and encloses an area of forty-eight acres. This extensive enclosure is now covered with gigantic forest-trees. One of them, a chestnut, measured twenty-one feet, and an oak, though greatly decayed, twenty-three feet in circumference, while the trunks of immense trees lay around in every stage of decay. Such was the aspect of Fort Hill, Ohio, a few years ago, and it is probably in no way changed now. Lyell mentions in his *Travels in North America*, that Dr. Hildreth counted eight hundred rings of annual growth in a tree which

grew on one of the mounds at Marietta, Ohio; and Messrs. Squier and Davis, from the age and condition of the forest, ascribe an antiquity to its deserted site of considerably more than a thousand years. In their present condition, therefore, the walls of the "Fort Hill" are ruins of an older date than the most venerable stronghold of the Normans of England; and we see as little of their original completeness, as in the crumbling Norman keep we are able to trace all the complex system of bastions, curtains, baileys, buttress-towers, and posterns of the military architecture of the twelfth century. Openings occur in the walls, in some places on the steepest points of the hill where access is impossible; and where, therefore, we must rather suppose that platforms may have been projected to defend more accessible points. The ditch has in many places been cut through sandstone rock as well as soil, and at one point the rock is quarried out so as to leave a mural front about twenty feet high. Large ponds or artificial reservoirs for water have been made within the enclosure; and at the southern point, where the natural area of this stronghold contracts into a narrow and nearly insulated projection terminating in a bold bluff, it rises to a height of thirty feet above the bottom of the ditch, and has its own special reservoirs, as if here was the keep and citadel of the fortress: doubtless originally strengthened with palisades and military works, of which every trace had disappeared before the ancient forest asserted its claim to the deserted fortalice. At this point the surveyors noted strong traces of the action of fire on the rocks and stones; though whether remote or recent, they found it difficult to determine.[1]

Here then, it is obvious we look on no temporary retreat of some nomade horde, but on a military work

[1] *Ancient Monuments of the Mississippi Valley*, pp. 14, 16.

of great magnitude, which, even with all the appliances of modern engineering skill, would involve the protracted operations of a numerous body of labourers, and when completed must have required a no less numerous garrison for its defence. And this may be taken as an example of the remarkable military earthworks, though they necessarily differ greatly in detail from their ingenious adaptation to their varying sites. One, called "Fort Ancient," built on two nearly detached terraces, rising with precipitous banks two hundred and thirty feet above the Little Miami River, Ohio, is walled by a range of embankments, measuring at the most accessible points from eighteen to twenty feet high, and extending altogether to a length little short of four miles, besides detached mounds, parallels, and overlapping curtain-walls. Professor Locke of Cincinnati, by whom Fort Ancient was minutely surveyed, with a numerous staff of assistants, states that "the number of cubic yards of excavation may be approximately estimated at 628,800;" and after discussing various geological and other evidences of the age of the ensulated hills and their elaborate earthworks, he concludes by expressing his astonishment "to see a work, simply of earth, after braving the storms of thousands of years, still so entire and well-marked." The walls, however, are formed of clay nearly impervious to water, and at numerous points are strengthened with large quantities of water-worn stones, seemingly taken from the bed of the river. Commenting on the same stronghold, Messrs. Squier and Davis remark: "A review of this magnificent monument cannot fail to impress us with admiration of the skill which selected, and the industry which secured this position. Under a military system, such as we feel warranted in ascribing to the people by whom this work was constructed, it must have been impregnable. In every

point of view it is certainly one of the most interesting remains of antiquity which the continent affords."[1]

Subsequent explorations conducted by Mr. Squier in reference to the "Aboriginal Monuments of the State of New York," led to the publication of the report, already referred to, on the numerous earthworks scattered through that and the borders of the adjacent States; and to his narrowing the area ascribed to the works of the Mound-Builders by assigning the origin of all such more northern remains surveyed by him, to the Iroquois and other Indian tribes known to have been in occupation of that region in comparatively recent times. The conclusions arrived at, on evidence thus cautiously considered, are of considerable importance in their indirect bearing on questions suggested by the characteristics of the more ancient works. Among the Indian tribes who have come under direct observation of the European colonists of their ancient possessions, none played a more prominent part than the united nations of the Iroquois. At the period of Dutch discovery in the beginning of the seventeenth century, they occupied the territory between the Hudson and the Genesee rivers, which they continued to maintain possession of for nearly two centuries thereafter, in defiance of warlike native foes, and the more formidable aggression of French invaders. The Iroquois exhibited a capacity for united action, and a consistent hereditary policy, without a parallel in Indian history. Their famous League, or Confederation of the Five Nations, was, as we have already seen, organized and maintained with an undeviating fidelity to their federal interests. Their numbers, at the period of their greatest prosperity, about the middle of the seventeenth century, have been variously estimated from 70,000, which La Hontan assigned

[1] *Ancient Monuments of the Mississippi Valley*, p. 21.

to them; to Bancroft's calculations, which reduce them to 17,000. Probably the estimate of the historian of their League—who considers his number of 25,000 as lower than the data he reasons from would justify,—may be considered as fair an approximation to the actual numbers as can now be made. Very exaggerated pictures have been drawn by some modern writers of this Iroquois confederacy, as though it were a well-organized oligarchical government of federal states, not greatly inferior to the civil institutions of Mexico and Peru. Such an idea is wholly inconsistent with facts. The Iroquois, it has been already shown, were a mere nation of savage hunters, among whom only the earliest germs of incipient civilisation are traceable. Though still in the hunter state, they had nevertheless acquired settled habits, and devoted themselves to some extent to agriculture. Such a people must be considered to present the highest type of the hunter state. But with all the long-matured arts resulting from such combined action, in the maintenance of a settled territory for successive generations against fierce hostile tribes, and the defence of an extensive frontier constantly exposed to invasion, the traces of the Iroquois strongholds are of the slightest and most ephemeral description. After completing his survey of them, Mr. Squier remarks:—"From the facts which have fallen under my notice, I feel warranted in estimating the number of ancient works which originally existed in the State at from two hundred to two hundred and fifty. Probably one half of these have been obliterated by the plough, or so much encroached upon as to be no longer satisfactorily traced. Were these works of the general large dimensions of those of the Western States, their numbers would be a just ground of astonishment. They are, however, for the most part comparatively small, varying from one to four acres,—the largest

not exceeding sixteen acres in area. The embankments, too, are slight, and the ditches shallow; the former seldom more than four feet in height, and the latter of corresponding proportions;" and their history is completed by the fact that the numerous relics found within their enclosures entirely correspond with the arts practised by the Indians in the earlier periods of their intercourse with Europeans.

From all the facts thus presented to our consideration, it is obvious that the highest estimate we can entertain of the remarkable powers of combination indicated by the famous League of the Iroquois, or all the singularly interesting germs of an incipient civilisation which we detect in the history of "the Five Nations," furnish no evidence of a capacity for the construction and maintenance of works akin to those selected as illustrations of the strongholds of the Mound-Builders in the Ohio valley. Striking as is the contrast which the Iroquois present to more ephemeral savage tribes, the remains of their earthworks are not less inferior to those of the Mound-Builders than the latter are to the elaborate and ornate architecture of Mexico and Yucatan. There are indeed points of resemblance between the strongholds of the two, as there are between them and the British hill forts, or any other earthworks erected on similar sites; but beyond such general elements of comparison, —equally interesting, but as little indicative of any community of origin as the correspondence traceable between the flint and stone weapons in use by the builders of both,—there is nothing in such resemblances calculated to throw any light on the origin of those remarkable monuments of the New World. It is rather from the striking contrast between the two that we may turn the remains of Iroquois military engineering to account, as suggestive of the greatly more advanced

condition of social life and the arts of a settled population among the ancient Mound-Builders of the Mississippi and its tributaries.

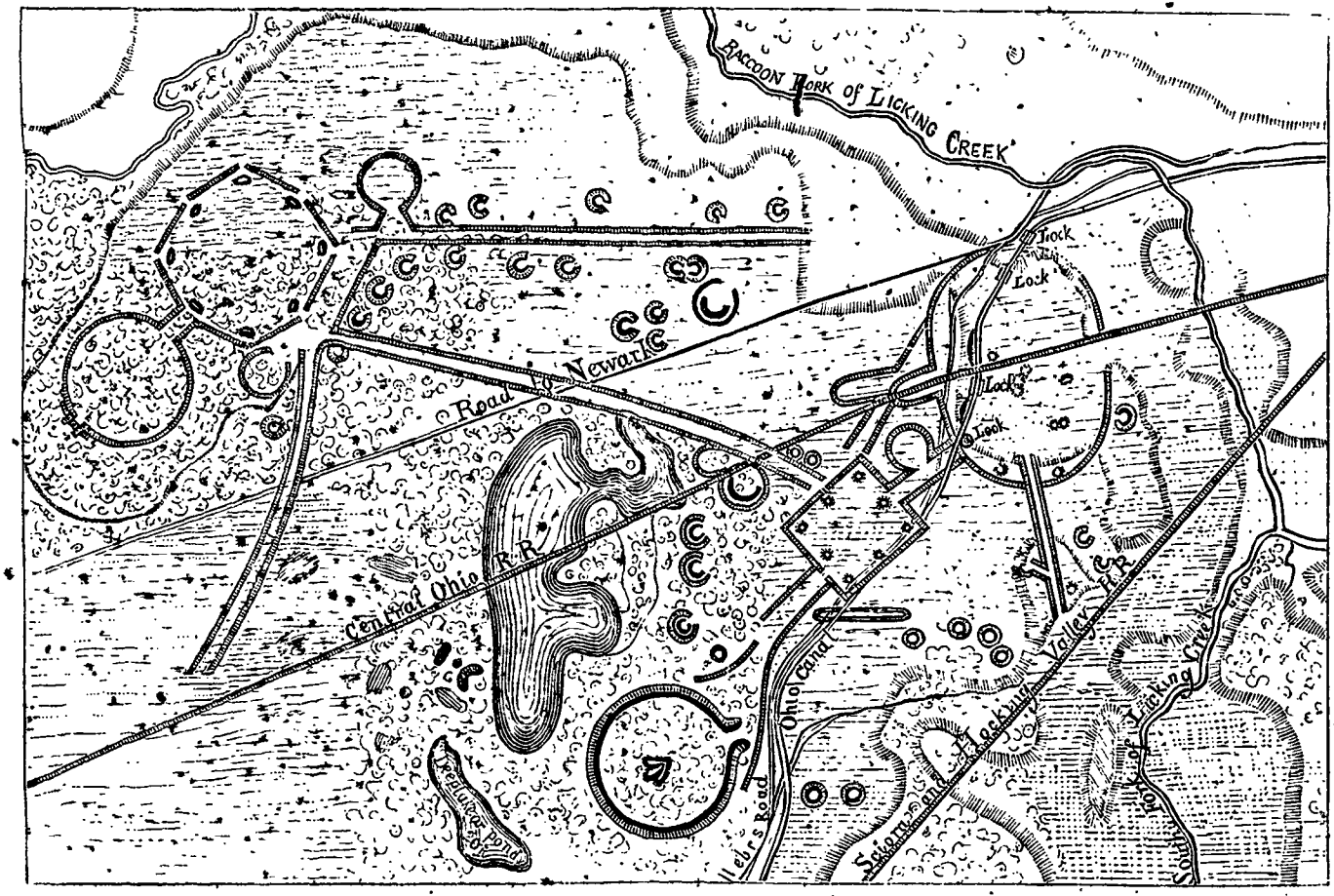
Further proofs of the settled character of this ancient population are furnished by another class of defensive works which are assumed, with much probability, to mark the sites of fortified towns. One of these, called "Clark's Work," on the north fork of Point Creek, in the Scioto valley, embraces in its main defences and a uniform rectangular outwork, an area of one hundred and twenty-seven acres, and encloses within its circumvallations sacrificial mounds and symmetrical earthworks, assumed with every probability to have been designed for religious or civic purposes. In this, as in some other examples, a stream has been turned from its original course into an entirely new channel, in order to admit of the completed circuit of the walls. Considerable traces of the action of fire are apparent on some portions of the work; and within its enclosures many of the most interesting relics of ancient art have been dug up, including several coiled serpents carved in stone, and carefully enveloped in sheet mica and copper; pottery, carved fragments of ivory, discoidal stones, and numerous fine sculptures in the same material. "The amount of labour," Mr. Squier remarks, "expended in the construction of this work, in view of the imperfect means at the command of the builders, is immense. The embankments measure together nearly three miles in length; and a careful computation shows that, including mounds, not less than three million cubic feet of earth were used in their composition."[1]

It is obvious that the population capable of furnishing the requisite labour for works of so extensive a nature

[1] *Ancient Monuments of the Mississippi Valley*, pp. 26-29, plate x.

must have been great, and its resources for the maintenance of such a phalanx of workers proportionally abundant. The garrisons of the great strongholds, and the population that found shelter within such extensive mural defences as "Clark's Work," must also have been very large, and requiring for their subsistence the contributions of an extensive district. Such conclusions are the manifest and inevitable deductions from the evidence which the two classes of defensive works afford; and they derive abundant confirmation from those of diverse character. "By a minute attention to the various details of their defensive works," the authors of the elaborate Report on the Ancient Monuments of the Mississippi Valley remark, "we are prepared to estimate the judgment, skill, and industry of their builders. No one can rise from such an examination except with the conviction that the race by whom these works were erected, possessed no inconsiderable knowledge of the science of defence, a degree of knowledge much superior to that known to have been possessed by the hunter tribes of North America previous to the discovery by Columbus, or indeed subsequent to that event. Their number and magnitude must also impress the inquirer with enlarged notions of the power of the people commanding the means for their construction, and whose numbers required such extensive works for their protection." The evidence of many sections of the country having once been filled by a dense population is no less conclusive, when we turn from the consideration of single large works of the class already referred to; and estimate the number and extent of the mounds, symmetrical enclosures, and earthworks of various kinds connected with the arts of peace and the rites of religious worship, which give so striking a character to the same river valleys and terraces where such extensive

"NEWARK EARTHWORKS."



To face page 335, vol. i., Wilson's *Prehistoric Man*.

fortifications crown the insulated heights best adapted by nature for defence.

The class of earthworks designated as Sacred Enclosures has been separated from the military works of the Mound-Builders on very obvious grounds. Instead of the elaborate fortifications, adapted in each case to all the natural features of the well-chosen site, and strengthened by external ditch, mound, and complicated approaches: the broad levels on the river terraces have been selected for their religious works. There, on the great unbroken level, have been constructed groups of symmetrical enclosures, square, circular, elliptical, and octagonal; and with long connecting avenues, suggesting comparisons with the British Avebury, or the Hebridean Cullernish; with the Breton Carnac; or even with the temples and Sphinx-avenues of the Egyptian Karnak and Luxor. The embankments or earthwalls are generally slight, varying, in the majority of cases, from three to seven feet in height; and where a ditch occurs it is in the interior. Exceptional cases, however, exhibit the walls on an imposing scale, as in the great circle at Newark, Ohio, which forms part of an extensive and complicated series of square, circular, and polygonal enclosures, with mounds and connecting avenues, extending over nearly four square miles. This singular group, designated "The Newark Works," will be best understood by a reference to the accompanying engraved plan, taken from surveys executed since those of Mr. Charles Whittlesey, which are engraved in the work of Messrs. Squier and Davis.[1] They differ in one or two minor details, but a comparison of the plans will be found chiefly interesting from showing the changes effected by modern civilisation in a very few years, on a region which, to all appearance, had previously remained un

[1] *Ancient Monuments of the Mississippi Valley*, plate xxv.

altered through many centuries. From the plate it will be seen that the group consists of a complicated series of works, symmetrical in their principal features, but constructed apparently with reference to a uniform plan, and connected by long avenues and other subordinate works, some of which appear to be subsequent additions to the original design. The engraving, however, conveys a very imperfect idea of the scale on which the whole is constructed. An elliptical enclosure, measuring respectively twelve hundred and fifty, and eleven hundred and fifty feet in its diameters, is formed by embankments about twelve feet in perpendicular height, by fifty feet of base, and with an interior ditch seven feet deep by thirty-five feet wide. At the entrance, which, as a nearly invariable rule, is placed towards the east, the ends of the enclosing walls curve outwards for a distance of a hundred feet, with the ditch continued along the inner side of each, leaving a level way between the edges of the ditch on either side, like a terraced viaduct, measuring eighty feet wide. Overhung as it is with the gigantic trees of a primitive forest, the surveyors describe their sensations on first entering the ancient avenue as akin to the awe with which the thoughtful traveller is impressed when entering the portal of an Egyptian temple, or gazing upon the silent ruins of Petra. In the centre of this enclosure is a remarkable structure, apparently designed to represent a gigantic bird with expanded wings; but on opening it, an "altar" was found under the centre of the long mound constituting the body; in which respect it differs from anything hitherto noted in exploring the emblematic mounds of Wisconsin. The fact, however, is an important one, tending as it does to confirm the idea that the great circle and its group of earthworks all bore some relation to the strange rites of religion once practised within those singular circumvallations under the

broad canopy of heaven. From the great elliptical enclosure a wide avenue of two dissimilar parts, seemingly constructed without relation to each other, leads to a square enclosing an area of twenty acres, with seven mounds disposed symmetrically within the enclosing walls. Beyond, this avenue is continued in the same direction till it joins another group of works, including embankments, avenues, mounds, and a graded way between elevated parallel walls, leading down to the lower level where the South Fork joins the Racoon Creek, as it flows eastward to the Licking river. In the opposite direction two long avenues lead westward, one of them ascending by a graded way from the same lower level, and the other joining the enclosed square, and leading from a portal in the centre of its western enclosure. The parallel walls of these avenues are upwards of a mile long, and two hundred feet apart, and both terminate at an octagonal earthwork, enclosing upwards of fifty acres, beautifully level, except where a truncated pyramidal elevation stands in front of the gateway opened at each of its angles. From the widest of these, on its south-western side, parallel walls, enclosing an avenue sixty feet wide, extend a distance of three hundred feet, connecting the octagon with a circular work 2880 feet, or upwards of half a mile, in circumference; and notwithstanding its great scale, the surveyors specially note that they ascertained this work to be *a true circle.* Opposite to the junction of the avenue-parallels with the wall of the circle, corresponding parallels are continued a distance of one hundred feet, and then midway across this an immense oblong mound intersects and rises above the parallels. It measures 170 feet long, and rises eight feet above the walls of the circle, so as to present a point from whence the whole works can be overlooked. It has been called the "Observatory" on this account; but it is a remarkable and unique

feature, the original purpose of which it is difficult to surmise. Since the publication of the *Smithsonian Report*, a trench has been cut through it, from which it is proved to be entirely constructed of clay; and the conclusion suggested to careful observers appears to be that this, as well as others of the more important earthworks, were regularly built of adobes, or sun-dried bricks, the external and exposed surfaces of which have gradually crumbled away, and been clothed with the vegetation of many centuries. From the octagonal enclosure a third avenue extending towards the south has been traced for nearly two miles, where its walls gradually lose themselves in the plain. They are placed about two hundred feet apart, and have been ascertained to be parallel throughout. Numerous minor works, mounds, pyramids, and circles of smaller dimensions are included within the same group of earthworks; and a number of small circles, about eighty feet in diameter, have been supposed, with much probability, to mark the sites of ancient circular dwellings. In one of these a relic, called "the Ohio Holy Stone," is affirmed to have been discovered, bearing a Hebrew inscription, which has recently attracted an amount of attention amusingly characteristic of the credulous wonder with which the ancient earthworks are regarded. Without the accompanying plan, the above description would convey a very vague idea of the remarkable works of which the Newark group is selected as a type. While presenting certain analogies to the mound-groups and enclosures both of Europe and Asia, in many other respects they are totally dissimilar, and illustrate rites and customs of an ancient American people unparalleled in the monumental memorials of the Old World.

Several striking coincidences between the details of these works and others of the same class are worthy of

notice. The diameter of the circle, the perfect form of which has been noted, is nearly identical with two others forming parts of remarkable groups in the Scioto valley, one of them seventy miles distant. The square has also the same area as a rectangular enclosure belonging to the "Hopeton Works," where it is attached to a circle 1050 feet in diameter, and to an avenue constructed between two parallel embankments 2400 feet long, leading to the edge of a bank immediately over the river-flat of the Scioto. A like coincidence in the precise extent of the area enclosed, is noticed in the octagon of another remarkable group, called the High Bank Works, on the same river-terrace; and in another, at the junction of the Muskingum and Ohio rivers. A similar agreement is also observable in the smaller features of the groups; and such coincidences acquire additional importance when taken in connexion with another fact bearing directly upon the degree of knowledge possessed by the Mound-Builders. The authors of the elaborate and careful survey of their works remark:—"Many, if not most, of the circular works are *perfect circles*, and many of the rectangular works are *accurate squares*. This fact has been demonstrated in numerous instances by careful admeasurements, and has been remarked in cases where the works embrace an area of many acres, and where the embankments or circumvallations are a mile and upwards in extent."[1]

Again, the same minute observers remark:—"The square or rectangular works attending these large circles —some of them embracing fifty or more acres,—are of various dimensions. It has been observed, however, that certain groups are marked by a great uniformity of size. Five or six of these are *exact* squares, each measuring 1080 feet a side, —a coincidence which could not pos-

[1] *Ancient Monuments of the Mississippi Valley*, p. 8.

sibly be accidental, and which must possess some significance. It certainly establishes the existence of some standard of measurement among the ancient people, if not the possession of some means of determining angles."[1] It is no less important to note that it establishes with equal certainty the use of instruments. A standard of measurement could not exist, still less be applied, on so large a scale in geometrical construction, without some instruments; and the very simplest of these that we can conceive of, constitute a no less certain evidence of the very different condition of intellectual development attained by this ancient people from anything achieved by the most advanced Indian tribes. Varied, moreover, as the combinations of their singular groups of earthworks are, traces are clearly discernible that certain well-defined plans of construction, and a proportionate scale of parts, guided their builders. In Liberty township, Ross county, Ohio, a somewhat complicated group occurs, occupying a level terrace on the east bank of the Scioto river. Of this the surveyors remark:—"This work is a very fair type of a singular series, occurring in the Scioto valley, all of which have the same figures in combination, although occupying different positions with respect to each other, viz., a square and two circles. These figures are not only accurate squares and perfect circles, but are in most cases of corresponding dimensions; that is to say, the sides of each square are 1080 feet in length, and the diameter of each of the large and small circles is a fraction over 1700 and 800 feet. Such were the results of surveys made at different times, the measurements of which correspond within a few feet. Although in the progress of investigation singular coincidences were observed between these works, yet there was at the time no suspicion of the

[1] *Ancient Monuments of the Mississippi Valley*, p. 48.

identity which subsequent comparison had shown to exist." Justly estimating the importance of such coincidences, and the still greater value of the evidence of the perfect construction of geometric figures on so large a scale, the authors of the surveys have detailed their method of procedure, in order "to put at once all scepticism at rest, which might otherwise arise as to the regularity of these works." This important point rests accordingly on the most satisfactory evidence;[1] nor are even the imperfections observed in the construction of some of the rectangular figures without their significance, as a test of the extent to which geometry had been mastered by the ancient builders. About five miles below the town of Chillicothe, on the right bank of the Scioto river, the terrace spreads out into a beautiful level plain of great extent, terminating abruptly in a bold bank between seventy and eighty feet high, and washed at its base by the river. On the edge of this river-terrace a group of enclosures exist, including mounds, avenues, circles, and other figures in combination; but the principal work consists of an octagon and a circle, the former measuring 950 feet, and the latter 1050 feet in diameter. The circle is a perfect one, but the octagon is not strictly regular, although its alternate angles are coincident and its sides equal. It is joined to the circle by a short avenue formed by the continuation of the embankments at one of its angles, and eight mounds are regularly disposed within the angles, so that there can be no doubt it was designed to be a regular octagon; and indeed it is sufficiently accurate to satisfy the eye, though its imperfection thus serves as a gauge of the geometric accuracy of its constructors. Most probably it was constructed on a circle.

Such may suffice to illustrate some of the most strik-

[1] *Ancient Monuments of the Mississippi Valley*, p. 57.

ing and significant features of this remarkable class of ancient earthworks. That they were executed for some totally different purpose from the strongholds already described, is obvious: for their site is invariably on a level terrace; the embankments are frequently slight; where a ditch occurs it is generally in the interior; and the whole nature of the works is inconsistent with the supposition of their being designed for purposes of defence. They occur, moreover, in the vicinity of the defensive enclosures, showing that they are the work of the same builders; as in the case of the "Newark Works," Ohio, selected as one of the most elaborate and characteristic groups. The enclosures extend over the level terrace, and with outlying structures embrace an area of several miles in extent; and on each side of the Newark Valley, formed by the Racoon Creek, defensive works occupy two prominent elevations presenting special natural advantages for such strongholds. One of these encloses the summit of a high hill, and its details leave no doubt of its defensive character; yet it contains a small circle with enclosed mounds, covering "altars" corresponding to those hereafter described, which give their peculiar character to the sacred mounds of the great earthworks abounding on the river terraces. There is no room, therefore, for doubt that the various works referred to illustrate what may be styled the civil, military, and ecclesiastical structures of the same ancient people; and to the last of these classes must also be assigned another remarkable work in the same Newark Valley, called "The Alligator." It belongs to the class of animal mounds, and its description will, in a subsequent chapter, serve to illustrate other characteristics of these singular memorials of an extinct people.

Meanwhile, one of the most important inferences deducible from the peculiar features of the class of works

already referred to, is the state of knowledge of their constructors, as shown by the uniform dimensions and regularity of the figures adopted by them, in what are here designated their sacred enclosures. The most skilful engineer of our own day would find it difficult, without the aid of instruments, to lay down an accurate square on the scale of some of those described, enclosing an area four-fifths of a mile in circumference. Circles of moderate dimensions might indeed be constructed without the aid of instruments, so long as it was possible to describe them by a radius; but with such works measuring five thousand four hundred feet, or upwards of a mile in circumference, the ancient geometrician must have had instruments, and minute means of measuring arcs; for it seems impossible to conceive of the accurate construction of figures on such a scale otherwise than by finding the angle by its arc, from station to station, through the whole course of their delineation. It is no less obvious from the correspondence in area and relative proportions of so many of the regular enclosures, that the Mound-Builders possessed a recognised standard of measurement, and that some peculiar significance, possibly of an astronomical origin, was attached to figures of certain forms and dimensions.

An interesting discovery made in 1841, in excavating an ancient sepulchral mound within the limits of the city of Cincinnati, which has been the subject of some ingenious speculations by different writers, may possibly prove to have a special significance in reference to our present investigations. In the centre of the mound, and rather below the level of the surrounding surface, a skeleton was found greatly decayed, alongside of which lay two pointed bones, about seven inches long, formed from the tibia of the elk, and an engraved tablet of fine-grained sandstone, measuring five inches in length, by

two and six-tenths across the middle, and three inches in its greatest breadth at the ends. Upon its smooth surface an elaborate figure is represented, as shown in the accompanying illustration, by sinking the interspaces

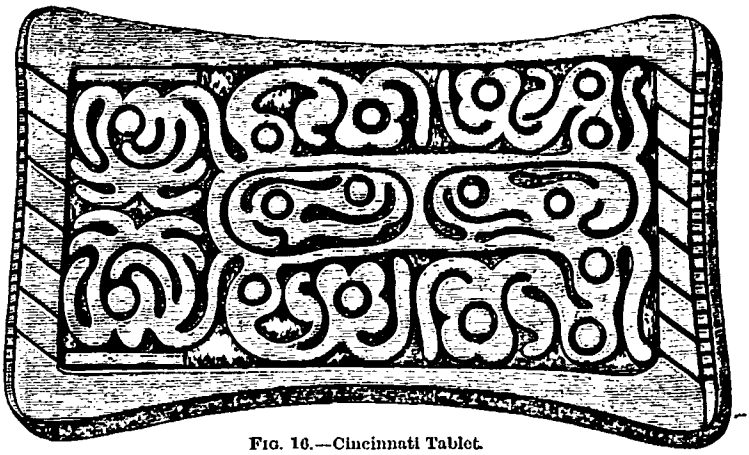


FIG. 16.—Cincinnati Tablet.

within an enclosing square, so as to produce what has been regarded as a hieroglyphic inscription. But the most remarkable features of its graven device are the series of lines by which the plain surface at each end is divided. The ends of the stone, it will be observed, are curved, and form arcs of circles of different dimensions. The greater arc is divided by a series of lines, twenty-seven in number, into equal spaces, and within this is another series of seven oblique lines. The lesser arc at the opposite end is divided in like manner by two series of twenty-five and eight lines, similarly arranged. This interesting discovery has not failed to receive due attention. It has been noted that it bears a "singular resemblance to the Egyptian cartouche." Its series of lines, after being duly counted and pondered over, were discovered to yield, in the sum of the products of the longer and shorter lines, a near approximation to the number of days of the year. This ingenious result furnished

grounds for ascribing to the tablet an astronomical origin, and so constituting it an ancient calendar, on which is recorded the primitive approximation of the Mound-Builders to the true length of the solar year. Mr. Squier perhaps runs to an opposite extreme in suggesting that it is probably nothing more than a stamp, such as have been found made of clay, both in Mexico and the Mississippi mounds, and appear to have been used in impressing ornamental patterns on cloth or prepared skins. Such clay stamps always betray their purpose by the handle attached to them, as in the corresponding bronze stamps of common occurrence on Roman sites; whereas the Cincinnati tablet is about half an inch in thickness, with no means of holding or using it as a stamp, and bears on its unfinished reverse the grooves apparently made in sharpening the tools by which it was engraved. But whatever theory be adopted as to its original object or destination, the series of lines on its two ends have justly attracted attention; for they constitute no part of the device, and if intended as an ornamental border would, it may be presumed, have been carried round the entire tablet. Another hypothesis may therefore be admissible, that here, possibly, is a record of certain scales of measurement. Only for the construction of regular curves could it be supposed that such minute subdivisions were required in the scale of a rude people. It has been noted that no two of its curves or lines are precisely alike. But this has been assumed as evidence alike of its imperfection and genuineness: Mr. Guest, its possessor, shrewdly remarking, that "a person in our times could scarcely make so perfect an engraving as this stone, and not make it more perfect." Yet the seemingly systematic variation of curve and scale in the two ends is suggestive of the idea that the variation in

the external curves is purposely designed. If this idea be accepted as probable, the discovery of a record pertaining to the instruments and standards of measurement of the Mound-Builders is calculated to add a new and more definite interest to our study of their geometrical constructions.[1]

Such may suffice to illustrate the predominant characteristics of one remarkable series of the ancient American earthworks: the precise objects aimed at in their construction it must obviously be difficult, if not, indeed, altogether impossible, to determine with any certainty. To these structures analogies have been supposed to be traced in the practice of the Indian tribes formerly in occupation of Carolina and Georgia, of erecting a circular terrace or platform on which their council-house stood. In front of this, a quadrangular area was enclosed with earthen embankments, within which public games were played and captives tortured. To this was sometimes added a square or quadrangular terrace at the opposite end of the enclosure. Upon the circular platform it is also affirmed that the sacred fire was maintained by the Creek Indians, as part of their most cherished rites as worshippers of the sun. But even the evidence, thus far, is vague and unsatisfactory. The scale upon which such southern Indian earthworks were constructed may compare with those still to be seen in the country of the Iroquois in the western parts of the State of New York, but in no degree approximates to the true works of the Mound-Builders. They lack, moreover, the avenues and other remarkable appendages, which constitute in reality the distinctive features of the great enclosures of the Ohio and Scioto valleys; while the evidences which these disclose of

[1] The woodcut is engraved from a rubbing taken from the original.

remarkable geometrical skill, the possession of a recognised standard of measurement, and a definite means of determining angles, with the repetition of earthworks of great and uniform dimensions on widely separated sites, all combine to illustrate a condition of society utterly incompatible with any characteristics of the most civilized Indian tribes known to Europeans.[1]

Much greater resemblances might be traced, without any great play of fancy, to the classic stadium or circus, and to the stone avenues of Carnac, Avebury, and Cullernish; but in any such comparisons we can go but a little way, without being compelled to make as large demands on the imagination as have already served to swell out bulky quartos of Druidical antiquarianism to so little purpose. What, for example, shall we make of the graded ways, such as that of Piketon, Ohio, where a graduated approach has been laboriously excavated

[1] It is important to bear in remembrance the nature of the evidence and authority for this. The remarkable group of geometrical earthworks in Liberty township, Ohio, includes a perfect circle, seventeen hundred feet in diameter; a smaller one, eight hundred feet in diameter; an accurate square, ten hundred and eighty feet long on each side; and the same figures, with precisely the same dimensions, were quite unexpectedly found to occur repeatedly throughout the Scioto Valley. On this subject the surveyors remark:—"To put at once all scepticism at rest, which might otherwise arise as to the regularity of these works, it should be stated that they were all carefully surveyed by the authors in person. Of course, no difficulty existed in determining the perfect regularity of the squares. The method of procedure, in respect to the circles, was as follows:—Flags were raised, at regular and convenient intervals, upon the embankments, representing stations. The compass was then placed alternately at these stations, and the bearing of the flag next beyond ascertained. If the angles thus determined proved to be coincident, the regularity of the work was placed beyond doubt. The supplementary plan A indicates the manner of survey," etc.—*Vide Anc. Mon. Miss. Valley*, p. 57, pl. xx. Added to this, we have the independent surveys of some of these works by Mr. Charles Whittlesey, topographical engineer of the State of Ohio, Mr. D. Morton, Mr. James M'Bride, and other professional surveyors. The later super-

and embanked, from one terrace to another, one thousand and eighty feet long by two hundred and fifteen feet in greatest width? The excavated earth has been employed, in part, to construct lofty embankments on each side of the ascent, which are now covered with trees of large size. Beyond this approach, mounds and half-obliterated earthworks indicate that it was originally only one part of an extensive series of structures. But, viewed alone, it is one of the most remarkable monuments of prehistoric times to be found on the whole continent, and certainly bears not the slightest resemblance, either in its character or the great scale on which it is executed, to any work of the Red Indians. But thus much these, and other works hereafter described, all combine to tell us: that, where the western settlers of the United States are now obliterating the ancient forests, from whence they have driven out their old

ficial interments of the Indian tribes are of common occurrence in the mounds, and easily distinguishable from their original contents, lying at a greater depth. Yet, ignoring all this, Mr. Schoolcraft, in speaking of the tribe of the Alleghans, says:—"A tumulus raised over the dead, a mound of sacrifice to the sun, a simple circumvallation, or a confused assemblage of ditches, mounds, and lines around a village, a ring-fort on a hill, or, in fine, a terraced platform of earth to sustain the sacred residence of the priest and ogema,—these must be deemed evidences which accurately restore, to the mind of the inquirer, the arts of their authors. They answer, I am inclined to think, the oft-made inquiry, Who erected these earthworks? . . . . They (the Alleghans) were, in truth, the Mound-Builders."—*Hist. of Ind. Tribes*, vol. v. p. 135. Yet it is in the very same volume that the author revives and accredits the apochryphal "Grave Creek Mound inscription," and states, "That the ancient Celtic character has been found in Western Virginia appears incontestable." He accordingly hints at its association with the Welsh *Madoc*,—a very suitable parentage for Celtic characters never heard of before by any Celtic scholar. The era of the mythic Madoc, son of Owen Gwyneth, king of North Wales, is 1169, about which date, therefore, the Alleghans must have deposited his incomprehensible Celtic in the Virginia mound.—*Vide Hist. of Ind. Tribes*, vol. v. p. 34.

Indian inheritors, there existed, before these forests, a people far higher in many of the characteristics and acquirements which tend to the elevation of nations, than those who have been regarded as the aborigines of the country, and the first reclaimers of the soil from the wild beasts that haunted its trackless wastes.

CHAPTER XI.

THE HEREAFTER: SEPULCHRAL MOUNDS.

THE remarkable characteristics revealed by the careful surveys of the ancient military and sacred enclosures of the Mound-Builders, have sufficed to disclose proofs of great value; in corroboration alike of the extent of the population by which such works must have been wrought, and of the progress they had already made in some departments of knowledge requiring a long period for their development, and incompatible with anything but a settled condition of society, in which agriculture and the arts of civilisation had already made some progress. From their great earth-mounds, however, as their most characteristic and remarkable structures, the ancient people of the Mississippi Valley have received their name; and the disclosures resulting from the exploration of these structures have thrown the greatest light on the arts and social habits of their long-extinct builders. The raising of memorial and sepulchral mounds of earth and stone has been practised among many nations in the earlier periods of their history. Where loose stones abound, the cairn is the simplest monumental structure, and has been adopted alike in Asia, Europe, and America (and, there can be little doubt, in Africa also), both to commemorate public events, and to mark with special honours the place of sepulture of some distinguished chief. But the accumulated materials of such rude

pyramids acquire a value as civilisation brings in its train the arts and settled habits of an agricultural people; and the cairn, converted into a quarry for building materials, rapidly disappears, while the seemingly slighter earth-pyramid, when clothed with its ever-renewing turf, remains almost indestructible. The germ of the sepulchral earth-mound—the rude type of the pyramids of Central America and Egypt,—is to be sought for in the little heap of earth, displaced by interment, which still to thousands suffices as the most touching memorial of the dead. In a primitive age, where the tomb of the great warrior or wise ruler was to be indicated by some memorable token of his people's veneration, the increase of the little grave-mound, by their united labours, into a gigantic barrow or earth-pyramid, would naturally suggest itself as the readiest and most marked distinction; and when we add to this the accompanying sepulchral rites and sacrifices, so abundantly illustrated by the practice of many ancient and modern pagan nations, we have a satisfactory key to the origin and characteristics of one class of the remarkable structures of America's ante-Columbian era. The earth-pyramids of the Mound-Builders are not, however, all sepulchral memorials; but, as has been already indicated, they include a numerous class manifestly associated with the religious rites and superstitions of their builders, and others presenting interesting analogies in form and structure to the teocallis of ancient Mexico and Yucatan.

In this, as in the previous chapter, our aim will be sufficiently accomplished by selecting one or two of the most characteristic types of the different classes of mounds as illustrations of the whole. But those ancient tumuli have a value of their own totally distinct from the great military, civic, and religious works already referred to. From the latter we are able to deduce

important conclusions in relation to the probable density of population, the amount of knowledge in military architecture and the strategy of defensive warfare, and their acquirements not only in combined mechanical operations, but in geometrical knowledge. But within both the religious and sepulchral mounds are treasured the memorials of ancient rites and customs, and the illustrations of the most prized and ingenious arts of their builders; while in the latter lie the bones of those in whose honour such costly piles were reared, disclosing to us the physical characteristics of a race whose imperfect civilisation had been arrested and brought to a close long before the conquest of Mexico and Peru. Those great earth-mounds of the Mississippi are for us not merely the sepulchral memorials of the ancient race; they are the cemetery of an early though partial civilisation, from whence we may exhume the chronicles of long-extinct nations; and recover illustrations of the life, manners, and ideas of a people over whose graves the forest had so long resumed its sway, that it seemed to the Red Indians' supplanters to have been the first occupant of the soil.

Tumuli, barrows, dunes, moat-hills, cairns, and earth or stone mounds of various kinds, abound in many parts of the Old as well as of the New World, and are nowhere more abundant than in some districts of the British Isles. But although the corresponding primitive structures are scattered over the continent of America from the Gulf of the St. Lawrence to the Isthmus of Panama, and beyond it, far into the southern continent, nevertheless the true works of the Mound-Builders have a character of their own altogether peculiar; and though numbered by thousands, they are limited to well-defined areas, leaving a large portion of the territory of the more recent Red Indian tribes, and the whole of the Atlantic

sea-board, without any traces of their presence. The Mound-Builders were not a maritime people. Their whole navigation was confined to the great rivers along the banks of which their ancient traces abound; and their commerce and traffic, though considerable, was entirely dependent on river navigation, and communication by long-obliterated overland routes of travel. Notwithstanding the careful and accurate observations which have been put on record relative to the mounds and earthworks of "The West," much yet remains to be disclosed; for, happily, the excavation of such earth-pyramids is a work greatly too laborious and costly to tempt their investigation by those who are influenced by mere idle curiosity; while the contents hitherto revealed to their explorers, however valuable to the archæologist, offer no such stimulus to cupidity as in Mexico and Peru has led to the destruction of thousands of the memorials of their extinct arts and customs. The mounds of the Mississippi Valley are sometimes composed entirely of clay, though resting on a soil of gravel or loam. Single mounds of stone, also, occasionally occur in the midst of a group composed of earth. Of the stone mounds or cairns, one situated about eight miles from Newark has acquired a certain factitious interest in the progress of demolition. It formed originally a conical pyramid forty feet high, and one hundred and eighty feet in diameter. But the stone of which it was composed led to its being appropriated as a convenient quarry for the construction and repair of a neighbouring reservoir, and fifty carts are stated to have been employed daily for a period of two years in transporting its materials to the new works. Here, in the fall of 1860, a party of explorers, digging among the foundations of the nearly levelled cairn, found another of those mound-inscriptions which bring into suspicion

all but the most thoroughly authenticated discoveries. Enclosed within a stone case of about nine inches long was a slab of hone-stone with a figure in flowing robes, in low relief, surrounded by an inscription partly in Hebrew, and partly in unknown characters, but which, nevertheless, has been interpreted as an abbreviated version of the whole Decalogue!

As a general rule, both the earth and stone works appear to have been constructed of materials derived from the immediate neighbourhood, so that such differences do not, in the majority of instances, supply any guide to a diversity in the enclosed deposits. A special character, however, appears to pertain to one class of such monuments, designated "Hill Mounds," from the elevated sites which they occupy. The authors of the *Ancient Monuments of the Mississippi Valley* remark: "On the tops of the hills, and on the jutting points of the table-lands bordering the valleys in which the earthworks are found, mounds occur in considerable numbers. The most elevated and commanding positions are frequently crowned with them, suggesting at once the purposes to which some of the mounds or cairns of the ancient Celts were applied: that of signal or alarm posts. It is not unusual to find detached mounds among the hills back from the valleys, and in secluded places, with no other monuments near. The hunter often encounters them in the depths of the forests when least expected; perhaps overlooking some waterfall, or placed in some narrow valley where the foot of man seldom enters." One class of these mounds has already been referred to among the more definite traces of ancient rites and ceremonies performed by means of fire, and of beacon-mounds used according to the familiar telegraphic system which has been employed in all ages, and by people in many diverse stages of social progress. Our knowledge of all

the characteristics of the mounds which crown many western heights has yet to be greatly extended, before we can assign to them the true and probably varied objects aimed at in their construction.

One hill-mound, however, has been excavated with highly interesting results. Among the illustrations of the *Ancient Monuments of the Mississippi Valley*, none has been more frequently referred to, or made the basis of more comprehensive generalizations, than the "Scioto Valley cranium," which is supposed to illustrate the physical type of the ancient Mound-Builders. To this, reference is made in a subsequent chapter; but its locality belongs to the present department of our subject. It was obtained from a mound situated on the summit of a high hill, overlooking the valley of the Scioto, where the most abundant traces of ancient earthworks have been observed. It is described as one of the most prominent and commanding positions in that section of the country. A conical knoll crowns the hill, rising with such great regularity as almost to induce the belief that it also is artificial; and, on its very apex, covered by the trees of the primitive forest, is the mound. It is only about eight feet high, and on being opened was found to be composed of tough yellow clay, underneath which a plate of mica rested on an inner mound composed chiefly of large rough stones, and below this, a compacted bed of dry carbonaceous matter contained the skull, with a few bones huddled round it, and some shells of the fresh-water molluscs from the neighbouring river. Here, therefore, is one interesting example of a sepulchral hill-mound; and in all probability, judging from the analogies of the ancient tumuli of Europe, the hill-mounds will be found in general to correspond in structure and contents with those of the plain; and so furnish evidence of the ancient population that crowded the

great valleys having been diffused in smaller numbers, far inland from the river's banks, in the outlying valleys and among the secluded recesses of the hills. There, perhaps, as among the higher valleys of the Andes, under the rule of the Incas, a pastoral people supplemented the agricultural industry of the central provinces, and shared with them the common rites and superstitions of the national religion.

In some cases the lofty site of the hill-mound may have determined its selection as conferring a further pre-eminence on the honoured dead. Such at least is the motive which occasionally guides the modern Indian in his selection of an elevated site for his grave; and of this a striking illustration is furnished in the history of one modern hill-mound on the Missouri. Upwards of forty years since, Black Bird, a famous chief of the Omahaws, visited the city of Washington, and on his return was seized with small-pox, of which he died on the way. When the chief found himself dying, he called his warriors around him, and, like Jacob of old, gave commands concerning his burial, which were as literally fulfilled. The dead warrior was dressed in his most sumptuous robes, fully equipped with his scalps and war-eagle's plumes, and borne about sixty miles below the Omahaw village, to a lofty bluff on the Missouri, which towers far above all the neighbouring heights, and commands a magnificent extent of landscape. To the summit of this bluff a beautiful white steed, the favourite war-horse of Black Bird, was led; and there, in presence of the whole nation, the dead chief was placed with great ceremony on its back, looking towards the river, where, as he had said, he could see the canoes of the white men as they traversed the broad waters of the Missouri. His bow was placed in his hand, his shield and quiver, with his pipe and medicine-bag, hung

by his side. His store of pemmican, and his well-filled tobacco-pouch were supplied, to sustain him on the long journey to the hunting-grounds of the great Manitou, where the spirits of his fathers awaited his coming. The medicine men of the tribe performed their most mystic charms to secure a happy passage to the land of the great departed; and all else being completed, each warrior of the chief's own band covered the palm of his right hand with vermilion, and stamped its impress on the white sides of the devoted war-steed. This done, the Indians gathered turfs and soil, and placed them around the feet and legs of the horse. Gradually the pile rose under the combined labour of many willing hands, until the living steed and its dead rider were buried together under the memorial mound; and high over the crest of the lofty tumulus which covered the warrior's eagle plumes, a cedar post was reared to mark more clearly to the voyagers on the Missouri, the last resting-place of Black Bird, the great chief of the Omahaws. In the old Pagan barrows on the wolds of Yorkshire, and far northward towards the Moray Firth, the ancient British and Saxon charioteers have been exhumed, with the iron wheel-tires and bronze horse-furniture, the wreck of the decayed war-chariot, and the skeletons of the horses: buried there with the dead chief, that he too might enter the Valhalla of his gods, proudly borne in the chariot in which he had been wont to charge amid the ranks of his foes. For man in all ages and in both hemispheres is the same; and, amid the darkest shadows of Pagan night, he still reveals the strivings of his nature after that immortality, wherein also he dimly recognises a state of retribution.

Among the numerous and minutely-detailed illustrations of Messrs. Squier and Davis's work on the *Ancient Monuments of the Mississippi Valley*, one of the most

striking evidences of the extent of occupation of the country, and the denseness of the population in the forgotten centuries recalled by their ancient works, is furnished by the map of a section of twelve miles of the Scioto Valley. Square, circular, and polygonal enclosures, single and in groups; parallels, ditches, and mounds, occupy every available terrace along the banks of the Scioto River, and its tributary Paint Creek. Within this once populous area, accordingly, elaborate surveys and explorations have furnished many interesting disclosures relative to the origin and objects of those remarkable structures, and several of the mounds have been opened so as thoroughly to illustrate their general structure and contents. They have been invariably found to cover a single skeleton: though in one or two exceptional instances in other localities, of which the Grave Creek Mound of Virginia is the most remarkable, more than one body has been deposited under the mound. Numerous as monuments of this class are, their relative numbers, when compared with the sacred and civic works of the same districts, abundantly prove that they are not the common places of sepulture, but monumental memorials of the distinguished dead. They vary in size from six to eighty feet in height, but the greater number range from fifteen to twenty-five feet; and frequently occur in groups, where smaller mounds are ranged round one of considerable dimensions. Such is the case with one in Ross county, Ohio. The group to which it belongs stands on the third terrace on the east side of the Scioto Valley, nearly a hundred feet above the river, and about equidistant from the High Bank Works, and those of Liberty township, on the lower terrace, two of the most remarkable sacred enclosures already referred to. The principal mound is twenty-two feet high; and on penetrating to its centre the traces of a rude sarcophagus or framework

of unhewn logs were found, the cast of which still remained in the compacted earth. The bottom had been laid with matting or wood, the only remains of which were a whitish stratum of decomposed vegetable matter; and the timbers once covering the simple sarcophagus had in like manner decayed, and allowed the superincumbent earth to fall on the enclosed skeleton. In this, as in most others of the opened tumuli, accordingly, the human bones were found crushed into fragments, which crumbled to powder under the lightest touch. Indeed, when it is borne in remembrance how frequently crania and other bones have been recovered from British tumuli and cromlechs in a perfect condition, though unquestionably pertaining not only to the Roman period, but to earlier ages dating beyond the Christian era: the decayed condition of the skeletons, thus protected alike from air and moisture in the centre of the large American mounds, furnishes a stronger evidence of their great antiquity than any of the proofs that have been derived either from the age of a subsequent forest growth, or the changes wrought on the river terraces where they most abound. Around the neck of the single skeleton deposited under this mound, were several hundred beads, made of the columellæ of marine shells and of the tusks of some animal; and, according to their discoverers, in some cases not only retaining their polish, but bearing marks which seemed to indicate that they were turned in some machine, instead of being carved or rubbed into shape by the hand. They retained their position, forming a triple row, as originally strung around the neck of the dead. A few laminæ of mica were the only other objects discovered in the grave. A layer of charcoal, about ten feet square, lay directly over the sarcophagus, and seemed, from the condition of the carbonized wood, to have been suddenly quenched by heaping the earth over it while still blazing.

Similar layers of charcoal frequently constitute a noticeable feature in mounds of this class, and seem to indicate either that sacrifices were performed over the bier, or that funeral rites of some kind were celebrated, in which fire played an important part. In these funeral pyres probably many perishable articles were consumed without leaving any trace behind, as the beds of charcoal are intermingled occasionally with fragments of bone, stone implements, and other evidences of sacrifices and tribute to the deceased. It is also apparent that the fire was kindled and allowed to blaze only for a limited time, when its flames were quenched by heaping the earth over the glowing embers. The rite may have been symbolical of the lamp of life quenched for ever by the grave, and was practised where cremation was not followed; so that, while charcoal occurs beneath as well as above the skeleton, the bones are found unaffected by fire. Implements, both of stone and metal, have been found in those grave-mounds, but for the most part they are such as indicate a totally different condition of society and mode of thought from what Indian sepulture implies. Weapons are of rare and exceptional occurrence. The more common objects are personal ornaments, such as bracelets, perforated plates of copper, beads of bone, shell, or metal, and similar decorations worn on the body at the time of its interment. Among the objects which appear to have been purposely disposed around the dead, plates of mica occur most frequently. In some cases the skeleton has been found entirely covered with this material; and in others the laminæ have been cut into regular figures: disks, ovals, and symmetrical curves. As a general rule, however, it would appear that reverence for the dead was manifested in other ways than by depositing costly gifts in the grave; nor do the relics found indicate any superstitious belief akin to that which

induces the modern Indian to lay beside his buried chief the arms and weapons of the chase, for use by him in the hunting-grounds and war-path of the land of spirits. A general uniformity is traceable in the arrangements and contents of the tumuli. In some cases the simple sarcophagus has been constructed of stone instead of wood; in others the body appears to have been merely wrapped in bark or matting. In some of the Southern States both cremation and urn-burial seem to have been practised, but throughout the valleys of the Ohio and its tributaries a nearly uniform system of sepulchral rites and observances has been traced. These no doubt bore some important relations to the solemn religious observances and superstitious practices indicated by other works of the same people; and as it is not in the sepulchral mounds, but in those which cover the "altars" on which the sacrificial fires of the ancient worshippers appear to have often blazed, that the greater number of their works of art, and even their implements and weapons have been found: it may be that there, rather than at the grave-mounds, they propitiated the manes of the dead, and sought by the sacrifices of love and reverence to reach beyond this world to one unseen.

So far as has hitherto been observed, the sepulchral mound is generally the memorial of a single interment; though the frequent occurrence of groups of four, five, or six mounds, where a central one of from twenty to thirty feet high is surrounded by others varying from four to ten feet in height, suggests a probable relation between the whole group. Contrary, however, to what would be expected from a people, whose earthworks are constructed on so large a scale, and in regular geometrical figures, the sepulchral mound groups appear never to have been symmetrically arranged. But their mode of grouping presents certain analogies to the ar-

rangements of cists and cinerary urns in ancient British tumuli, which suggest the probability of human sacrifices, and a suttee self-immolation at the grave of the great chief, so congenial to the ideas of barbaric rank. Such cruel rites we know were practised among the Mexicans and Peruvians on the largest scale; wives, concubines, and attendants being immolated by the latter on the tomb of their deceased Inca, in some cases even to the number of thousands. If, therefore, we suppose the size of the sepulchral mounds of the West to indicate the rank or popular estimation of the deceased, then the relative sizes and distances from the great central mound may have reference to the degrees of rank in the wife, favourite concubine, or official attendant; while the humbler victims, menials, and slaves, would be left to mingle with the common earth, with no memorial to perpetuate the costly sacrifice of their life's blood in celebration of the obsequies of their chief. Such ideas, as we have seen, pertain to the Indian tribes of the present day, no less than to the ancient civilized races of the New World; they are indeed singularly consonant to the rude conceptions of a future state which the untutored mind has realized to itself in all ages, when left to the unaided light of nature, and which perpetuate in a future life the habits, duties, and social distinctions of earth. The smallest of a group of mounds in the Scioto Valley was excavated, and found to contain the skeleton of a girl, enveloped in matting or bark, like those of the larger mounds; but no systematic exploration of such a group has yet been recorded. This, if carefully executed, with a minute record of all the contents of each mound, might reveal the origin of such groups, and the significance of their various sizes and relative positions; which can scarcely be supposed to be without their meaning among

a people who constructed their sacred and civic enclosures with such geometrical precision.

Among the sepulchral monuments of the Ohio Valley, the Grave Creek Mound, at the junction of Grave Creek with the Ohio river, in the State of Virginia, commands, on various accounts, a prominent distinction. It occupies a site on an extensive plain in connexion with various works now much obliterated; but its own gigantic proportions bid effectual defiance to the operations which are rapidly erasing the less salient records of the ancient occupants of the soil. In the year 1838, at a period when various circumstances had combined to direct an unusual degree of attention to American antiquities, Mr. Tomlinson, the proprietor of the land on which the Grave Creek Mound stands, had it explored at considerable cost. A perpendicular shaft was sunk from the top, and a tunnel was carried to the centre. The result of these excavations disclosed two sepulchral chambers, one at the base, and another thirty feet above. They had been constructed, as in other cases, of logs, which had decayed, and permitted the superincumbent earth, with stones placed immediately over them, to fall upon the enclosed skeletons. In the upper chamber a single skeleton was found in an advanced state of decay, whilst the lower one contained two skeletons, one of which was believed to be that of a female. With these were found between three and four thousand shell-beads, a number of ornaments of mica, several bracelets of copper, and sundry relics of stone carving, among which —if its genuineness could be satisfactorily authenticated, —an inscribed stone disk constitutes perhaps the most marvellous of all American antiquities. On reaching the lower vault, after removing its contents, it was determined to enlarge it into a convenient chamber for visitors, and in doing so ten more skeletons were dis-

covered, all in a sitting posture, but in too fragile a state to admit of preservation. The position of these, immediately around the sepulchral chamber, in the very centre of the mound, precludes all idea of subsequent interment, and scarcely admits of any other mode of accounting for their presence than that which the human sacrifices both of ancient and modern American obsequies suggest. The works of art contained in this and other ancient mounds will be referred to more in detail in subsequent chapters, when we come to review the characteristics of the Mound-Builders, as illustrated in their sculptures, implements, and personal ornaments.

A tumulus of the gigantic proportions of the Grave Creek Mound serves emphatically to impress the mind with the fact that such structures, even when of smaller dimensions, were not the accompaniments of common sepulture, but the special memorials of distinguished chiefs; or, it may be, at times, of the most venerated among the priests who presided over the long-forgotten rites of the sacred enclosures and the buried altars. Such a monument is the memorial no less of the toil of multitudes, than of the posthumous honours lavished on those whom they delighted to honour. But of the busy population that once thronged the valleys of the West we have no other sepulchral memorials than those which commemorate the toil of many to give a deathless name to one now as nameless as themselves. The investigators of their works, after describing in detail the monumental mounds, remark:—"The graves of the great mass of the ancient people who thronged our valleys, and the silent monuments of whose toil are seen on every hand, were not thus signalized. We scarcely know where to find them. Every day the plough uncovers crumbling remains, but they elicit no

remark; are passed by and forgotten. The wasting banks of our rivers occasionally display extensive cemeteries, but sufficient attention has never been bestowed upon them to enable us to speak with any degree of certainty of their date, or to distinguish whether they belonged to the Mound-Builders or a subsequent race. These cemeteries are often of such extent as to give a name to the locality in which they occur. Thus we hear, on the Wabash, of the 'Big Bone Bank' and the 'Little Bone Bank,' from which, it is represented, the river annually washes many human skeletons, accompanied by numerous and singular remains of art, among which are more particularly mentioned vases and other vessels of pottery, of remarkable and often fantastic form. At various places in the States, north of the Ohio, thousands of graves are said to occur, placed in ranges parallel to each other. The extensive cemeteries of Tennessee and Missouri have often been mentioned, and it has been conjectured that the caves of Kentucky and Ohio were grand depositories of the dead of the ancient people."[1] The Ohio and Erie canal is carried for miles along the river-terrace of the Scioto Valley, in the vicinity of Chillicothe, where the ancient works of the Mound-Builders are more abundant than in any other area of equal limits hitherto explored. In some cases the canal has been cut through the ancient works, and it can scarcely admit of doubt that many interesting traces of the arts and habits of the remarkable people who once filled the long-deserted scene, must have been disclosed to heedless eyes. Here and there, doubtless, a stray relic was picked up, wondered at, and forgotten; but no note was taken of the circumstances under which it was found, and no record made of the discovery. And so must it ever be. The pioneers of civilisation

[1] *Ancient Monuments of the Mississippi Valley*, p. 171.

in the uncleared wilds of the West are too entirely preoccupied with the present to spare a thought for long forgotten centuries. To their indomitable energy it is due that others can enter upon their labours with leisure for such thoughts; and that, through a fortunate combination of circumstances, such abundant and accurate data have been preserved relative to the prehistoric ages of America.

Various classes of mounds, probably also of a sepulchral character, have been subjected to exploration, with results differing from those which admit of the strict classification already referred to. More extended and systematic observations will, in all probability, group into new classes some that appear at present entirely anomalous; but the most noticeable indications hitherto disclosed by them suggest that cremation may have been commonly practised among the ancient Mound-Builders; or that a custom somewhat analogous to the scaffolding and final sepulture of the bones of the dead, as practised among many of the Red Indian tribes, may have prevailed; and that the bones thus periodically gathered were burnt, with fitting and solemn rites, and their ashes heaped together, forming mounds, such as one opened on the bank of Walnut Creek, in the Scioto Valley. The principal portion of this consisted seemingly of long-exposed and highly-compacted ashes, intermingled with specks of charcoal, and small bits of burned bones. Beneath this was a small mound of very pure white clay, resting on the original soil, without any traces of the action of fire; and over this the incinerated remains had been piled into a mound, nine feet in height by forty in base. The customs of the North American Indians, however, were, and still are very diverse; and among the ancient Mexicans and Peruvians also, inhumation, cremation, urn-burial, and mummification,

accompanied with deposition in artificial vaults and in caves, were all practised. It need not therefore surprise us to find many exceptions among the ancient Mound-Builders to any practice recognised as most prevalent among them. Considering the decayed state of most of the bones recovered from the great sepulchral mounds, where they were equally protected from external air and moisture: if the common dead were inhumed under the ordinary little grave-mound, their bones must, for the most part, have long since returned to dust, and mingled with their mother earth. Even if such be the case, however, the sites of their ancient cemeteries in all probability abound with many of the more indestructible relics of stone, metal, etc., repeatedly found in the larger mounds; nor must it be overlooked in the latter, that the extremely comminuted state to which most of their enclosed skeletons have been reduced, when brought to light by the modern explorer, is fully as much due to the falling in of a superincumbent mass of earth and stones upon them, when the timber ceiling of their sarcophagus had resisted the weight long enough only to render them the less able to resist its crushing force. The perfect preservation of the "Scioto Mound cranium," described by Messrs. Squier and Davis as "the only skull incontestably belonging to an individual of the race of the mounds which has been recovered entire, or sufficiently well preserved to be of value for purposes of comparison," was due to its being entirely embedded in charcoal, over which a superstructure of large stones enveloped with tough yellow clay had been piled, without any treacherous timber vaults; and thus it was found in perfect condition, as when originally deposited. For the mound in question presented another illustration of the practice of cremation. The skull was found in the centre of the carbonaceous deposit, resting on its face. The lower

jaw was wanting, and only the clavicle, a few cervical vertebræ, and some of the bones of the feet lay huddled around the skull. No relics of ancient art accompanied it, but it is, in itself, one of the most valuable relics hitherto recovered from the American mounds.

Such are the traces we are able to recover of the sepulchral rites of this ancient people. In discussing the conclusions suggested alike by their disclosures, and by those which the sacrificial mounds, the sacred enclosures, and the buried works of art of their constructors reveal, we are dealing with the characteristics of a people pertaining to periods long preceding the earliest era of written history. For us these are their sole chronicles; and yet, even from such data, we are able to recover some traces of their moral and intellectual characteristics: their reverence for the dead, their hope beyond the grave. But perhaps the most important conclusion to be noted for our present purpose is the general absence of weapons of war among the sepulchral deposits. It accords with many other indications of the condition of the Mound-Builders. They had passed beyond that rude stage of savage life in which war and the chase are the only honourable occupations of man, and the only conceivable enjoyments of his barbarian heaven. Their weapons of war, like their fortresses, were means for the defence of acquisitions they had learned to prize more highly. They had conquered the forests, and displaced the spoils of the hunter with the wealth of autumn's golden grain; and with the habits of a settled agricultural people, many new ideas had taken the place of the wild imaginings and dark superstitions begotten of the forest's gloom. As among all agricultural nations, the seasons of seed-time and harvest doubtless had their appropriate festivals; and we can still, in imagination, reanimate their sacred enclosures and long-drawn avenues

with the joyous procession bearing its thank-offering of first-fruits, or laden with the last golden treasures of the harvest-home. The analogies traceable through the customs and sacred rites of many nations help to depict for us such festive scenes; and in accordance with the changes of thought which such a social condition begets, the grave had ceased to be the mere passage from the chase and the warfare of forest life, to new hunting-grounds in a land haunted by the shadows of life's weary toils.

CHAPTER XII.

PROPITIATION: SACRIFICIAL MOUNDS.

THE name of sacrificial mounds has been conferred on a class of ancient monuments, altogether peculiar to the New World, and highly illustrative of the rites and customs of the ancient races of the mounds. From their contents also we derive many of the most interesting examples of the arts of that singular people, preserved on the "altars," where they appear to have been deposited, along with burnt-offerings to the gods of the ancient faith, or designed as the sacrifices of affectionate devotion to the manes of the dead. This remarkable class of mounds has been very carefully explored, and their most noticeable characteristics are: their almost invariable occurrence within enclosures; their regular construction in uniform layers of gravel, earth, and sand, disposed alternately in strata conformable to the shape of the mound; and their covering a symmetrical altar of burnt clay or stone, on which are deposited numerous relics, in all instances exhibiting traces more or less abundant, of their having been exposed to the action of fire.

The most striking feature of the sacrificial mounds, designated by their explorers "the altar," merits special attention; and a sufficient number of this class of mounds has been opened to justify the adoption of certain general conclusions relative to their construction

and the purposes for which they were designed. On the natural surface of the ground, in most cases, a basin of fine clay appears to have been modelled with great care, in a perfectly symmetrical form, but varying in shape, and still more in dimensions. They have been found square and round, elliptical and in the form of parallelograms; and, in size, range from a diameter of two feet, to fifty or sixty feet long, and twelve or fifteen feet wide. The most common dimensions, however, are from five to eight feet in diameter. The clay basin, or altar, invariably exhibits traces of having been subjected to the action of fire, and frequently of intense and long-continued or oft-repeated heat. It is, moreover, evident that in some cases the enclosed altar had not only been often used; but that after being destroyed by repeated exposures to intense heat, it had been several times remodelled before it was finally covered over by the superincumbent mound. Within the focus or basin of the altars are found numerous relics, elaborate carvings in stone, ornaments cut in mica, copper implements, disks, and tubes, pearl, shell, and silver beads, and various other objects, hereafter referred to, but all more or less injured by the action of fire. In some cases the carved pipes and other works in stone, have been split and calcined by the heat, and the copper relics have been melted, so that the metal lies fused in shapeless masses in the centre of the basin. Traces of cloth completely carbonized, but still retaining the structure of the doubled and twisted thread; ivory or bone needles, and other objects destructible by fire, have also been observed; and the whole are invariably found intermixed with a quantity of ashes. Large accumulations of calcined bones, including fragments of human bones, also lay above the deposits on the altars, or mingled with them; and in other cases a mass of calcined shells, or of

fine carbonaceous dust, like that formed by the burning of some vegetable matter, filled up the entire hollow of the altar. But while it is obvious from a few traces, that the deposits on the altars had included offerings of objects which yielded at once to the destructive element to which they were there exposed, as well as others capable in some degree of withstanding the intensity of the flame: there are only the faintest traces of all but the least destructible relics of stone or metal. In one mound a portion of the contents were cemented together by a tufa-like substance of a grey colour, resembling the scoriæ of a furnace, and of great hardness. But subsequent analyses demonstrated that it was made up in part of phosphates, and a single fragment of partially calcined bone found on the altar was the patella of a human skeleton. The long-continued, and probably oft-repeated application of intense heat had reduced the cemented mass to this condition. A quantity of pottery, many implements of copper, and a large number of spear-heads beautifully chipped out of quartz and manganese garnet, were also deposited on the altar; but they were intermixed with much coal and ashes, and were all more or less melted or broken up with the intense action of the fire. Out of a bushel or two of fragments of the spear-heads, and of from fifty to a hundred quartz arrow-heads, only four specimens were recovered entire. Fire also had been employed once more in the concluding rites, ere this altar was finally buried under the earthen mound, on the banks of the Scioto: garnering the chronicles of a long-extinct past, until its recent exhumation to tell its tale of forgotten rites and religious services practised there by the ancient occupants of the Ohio Valley. Scattered over the deposits of earth filling one of the compartments, and resting upon the sides of the altar, were found the traces of a number of pieces of timber, four or five

feet long. They had been somewhat burned, and the carbonized surface had preserved their casts in the hard earth, although the wood had entirely decayed. They had been heaped over while glowing, for the earth around them was slightly baked; and thus, after repeated, and perhaps long-protracted sacrificial rites, some grand final service had consummated the religious mysteries; and the blazing altar was quenched by means of the tumulus that was to preserve it for the instruction of future ages. Its explorers remark in reference to the traces of a timber scaffolding thus surmounting the altar at its closing services: "These pieces had been of nearly uniform length; and this circumstance, joined to the position in which they occurred, in respect to each other, and to the altar, would almost justify the inference that they had supported some funeral or sacrificial pile."

It thus appears that some of these altars remained in use for a considerable period, and were repeatedly renewed ere they were finally covered over by the sepulchral mounds. In one case, for example, of an oblong mound or barrow in the Scioto Valley, one hundred and forty feet in length, by sixty feet in greatest breadth, and eleven feet in height: already referred to as that in which so many quartz spear and arrow heads, along with copper and other relics, were found; a new and smaller hearth was observed to have been constructed within the oblong basin of the original altar. Within this smaller compartment all the relics deposited in the mound were placed, and the outer compartments of the large basin had been filled up with earth to a uniform level, the surface of which showed traces of fire. Upon attempting to penetrate the altar so as to ascertain its thickness, the task proved one of great difficulty owing to its extreme hardness; and when at length it was effected, the clay was found to be burnt to the depth of twenty-two inches.

As such a result seemed one that could hardly be accounted for by the action of any degree of heat applied from above, a more minute examination was instituted, and it was discovered that three successive altars had been constructed, one above another, in addition to the smaller hearth or focus which had received the final sacrificial offerings, ere it was buried under its enclosing mound. In other examples, however, these altars have been observed to be very slightly burned; but wherever such was the case, they have also been observed to be destitute of remains.

Along with the manifest evidences of a uniformity of system and purpose in those remarkable structures, there is also a considerable variety in some of their details; and one group may be selected, as on several accounts possessing peculiar features of interest. On the western bank of the Scioto River, an ancient enclosure occupies a level terrace immediately above the river. In outline it is nearly square with rounded angles, and consists of a simple embankment, between three and four feet high, unaccompanied by a ditch, or any other feature suggestive of its having been a place of defence. It encloses an area of thirteen acres, within which are twenty-four mounds, including the large oblong one already referred to. The whole of these have been excavated, and found to contain altars and other remains, which prove beyond doubt that they were places of sacrifice, dedicated to sacred and superstitious rites, and not to sepulture. Here, therefore, was one of the sacred enclosures of the Mound-Builders: a temple of their long-forgotten faith, inroofed only by the azure vault of heaven, like the open British temples of Avebury and Stonehenge. To this remarkable enclosure the name of "Mound City" has been given, and the results of its exploration prove it to have been one of the most remarkable scenes of ancient

ceremonial in the Scioto Valley. It would almost seem as if here had been reared an altar to each god in the ancient American pantheon; for not the least remarkable feature observed in reference to the altars of the mounds is, that their deposits do not exhibit a miscellaneous assemblage of relics, like the contents of an Indian ossuary or grave-mound. On the contrary, the sacrificial deposits are generally nearly homogeneous. On one altar sculptured pipes are chiefly found, sometimes to the number of hundreds; on another, pottery, copper ornaments, stone implements, or galena; on others, only an accumulation of calcined shells, carbonaceous ashes, or burnt bones. A few altars have also been noticed, which, though much burned, have no deposit upon them, except a thin layer of phosphate of lime, which seems to have incorporated itself with the clay of which they are composed. Such was the case with three of those explored within the "Mound City;" and it appeared to their explorers that, though repeatedly used, they had been carefully cleared of all their contents before being heaped over, and buried under the final mound. The altar under one of the mounds of this enclosure was a parallelogram of the utmost regularity, measuring ten feet in length, by eight in width, and with its basin of the same rectangular form. It contained a deposit of fine ashes, with fragments of pottery, from which the pieces of one beautiful vase were recovered and restored. With these also lay a few shell and pearl beads. In another oblong mound, the altar was an equally perfect square, but with a circular basin, remarkable for its depth, and filled with a mass of calcined shells. Another, though of small dimensions, contained nearly two hundred pipes, carved with ingenious skill, of a red porphyritic stone, into figures of animals, birds, reptiles, and human heads. In addition to these were also disks, tubes, and ornaments

of copper, pearl and shell-beads, etc., but all more or less injured by the heat, which had been sufficiently intense to melt some of the copper relics. The number and value of the objects found in this mound exceed any other single deposit; and some of them supply illustrations of great importance relative to the arts, habits, and probable origin of their makers. A like diversity marks the contents of other mounds, both within the sacred enclosure here referred to, and in others where careful explorations have been effected. In one, for example, the whole area was covered with two layers of disks of horn stone, some round and others oblong. Upwards of six hundred were taken out, and it was estimated that the entire deposit numbered little short of four thousand. From those, and other examples, it appears that burnt-offerings and sacrifices by fire were practised as an important and oft-repeated part of the sacred rites to which the altar-mounds were devoted: yet that also certain specific and varying purposes were aimed at in the offerings made on different altars. While, also, these altar-mounds are chiefly found within what appear to have been sacred enclosures, devoted — as has been assumed from a variety of evidence,—primarily, if not exclusively, to religious purposes; they also occur, generally, as single works, within the military enclosures and strongholds: where it may be assumed they sufficed for sacrifices designed to propitiate the objects of national worship, and to win the favour of their deities when the ancient garrisons were precluded from access to the sacred enclosures where the national religious rites were chiefly celebrated.

Within a quarter of a mile to the south of "Mound City" is a work of somewhat similar outline, but of larger dimensions, and with some of the characteristics of a defensive rather than of a sacred enclosure. From its

position, indeed, in relation to that remarkable circumvallated group of mounds, and also of other enclosures and earthworks in the vicinity, the nature of its construction suggests the idea of a fortified site; not designed as a military stronghold, but as a walled town, wherein may have resided those who officiated at the sacrifices of the adjacent temple. Unlike the slight enclosure of the latter, its walls are further guarded by an outer fosse, and if surmounted by a palisade, or other military work, they were well suited for civic defence. The area thus enclosed measures twenty-eight acres; and very nearly, if not exactly, in the centre there is a sacred mound, which was found, on excavation, to contain an altar of singular construction, and with remarkable traces of sacrificial rites. Like other altars of the explored mounds, this one appeared to have undergone repeated changes throughout the period intervening between the first rites and ceremonies performed on the site, and that of its final inhumation. The traces of these are thus minutely recorded by its intelligent explorers:—"This altar is entirely peculiar. It seems to have been formed at different intervals of time, as follows:—First, a circular space, thirteen feet in diameter and eight inches in depth, was excavated in the original level of the plain; this was filled with fine sand, carefully levelled, and compacted to the utmost degree. Upon the level thus formed, which was perfectly horizontal, offerings by fire were made; at any rate a continuous heat was kept up, and fatty matter of some sort burned, for the sand to the depth of two inches is discoloured, and to the depth of one inch is burned hard and black, and cemented together. The ashes, etc., resulting from this operation were then removed, and another deposit of sand, of equal thickness with the former, was placed above it, and in like manner much compacted. This was moulded into the altar-form,

identical with that of the circular clay altars already described, the basin in this case measuring seven feet in diameter by eight inches in depth. This basin was then carefully paved with small round stones, each a little larger than a hen's egg, which were laid with the utmost precision, fully rivalling the pavior's finest work. They were firmly bedded in the sand beneath them, so as to present a regular and uniform surface. Upon the altar thus constructed was found a burnt deposit, carefully covered with a layer of sand, above which was heaped the superstructure of the mound. The deposit consisted of a thin layer of carbonaceous matter, intermingled with which were some burnt human bones, but so much calcined as to render recognition extremely difficult. Ten well-wrought copper bracelets were also found, placed in two heaps, five in each, and encircling some calcined bones,—probably those of the arms upon which they were worn. Besides these were found a couple of thick plates of mica, placed upon the western slope of the altar."[1]

All the results of such investigations thus coincide in proving that the altars of the Mound-Builders were used for considerable periods, and repeatedly renewed, before they were finally covered over. Others undoubtedly remained to the last uncovered, though their exposure has necessarily left them in a very different condition from those now revealed for the first time to human eyes since the last rites of the ancient worshippers extinguished the sacred fires on their hearth. These appear to have been noted from time to time under the name of "brick-hearths." The hard-burnt clay, cracked and broken up by the roots of trees, the action of frost, and other causes, and partially buried by the accumulating vegetation and decay of centuries, when brought to light

[1] *Ancient Monuments of the Mississippi Valley*, p. 157.

by the plough or the spade, not unnaturally suggested the idea of rude brick pavings. One of these, discovered near the town of Marietta, in Ohio, was surrounded by a low bank, of about one hundred feet in circumference, seemingly the ground-plan or commencement of a mound. All such "hearths" or altars were, indeed, it may be assumed, destined to receive their final completion by means of the incovering mound. But, by whatever causes brought about, the day at length came when the dominion of the Mound-Builders was brought to a close; and probably not less abruptly than that of the Aztecs of Mexico or the Incas of Peru. The sacred fires were extinguished, the uncovered altars were desecrated, and the primeval forest slowly resumed its sway over the deserted temples and silent cities of the dead. The exploration of the sacred mounds, however, has sufficed to show that the covering over of the altar was a work of no less systematic care than any of the previous rites and ceremonies. The sepulchral mounds are simple covers or earth-pyramids, sometimes elliptical or pear-shaped, but exhibiting in their internal structure no trace of any further design than to heap over the sarcophagus of the honoured chief such a gigantic tumulus as should preserve his name and fame to after times. It is altogether different with the sacred mounds. The uniform stratification of the materials composing them has already been specified as one of their peculiar characteristics, and will be best illustrated by tracing the process of construction as disclosed in one of those of "Mound City;" though it is to be noted that while the evidence of a careful and systematic deposition of the materials forming the mound is found in all, the differences in these details are fully as great as in those of the enclosed altars. In the construction of the mound referred to, which occupies the north-east corner of the sacred en-

closure, near the edge of the steep bank immediately overhanging the Scioto River, the following were distinctly traceable as the successive stages in its process towards completion. On the natural level of the soil an altar or basin of fine clay was constructed, perfectly circular, and measuring nine feet in diameter. From the outer edge the clay walls were raised at an angle of about 40° to the height of twenty inches, and within this a hollow basin was formed nine inches deep. After this clay structure had been subjected to long and repeated action of intense heat—as is assumed from its being used as an altar of burnt-sacrifice,—until it had been burnt throughout to the consistency of the hardest brick, the basin was filled up evenly with fine dry ashes, intermingled with which were fragments of pottery, and a few copper bosses or disks. This deposit having been carefully levelled to the edge of the altar-focus, a layer of silvery or opaque mica, in sheets, was laid with great regularity over it, the mica plates overlapping each other, and on this was heaped a pile of human bones, reduced to fragments by the action of fire, but probably the remains of only a single skeleton. Above this, and extending beyond the outer verge of the altar, a layer of earth a few inches in thickness was uniformly spread, presenting, in miniature, the final shape of the mound. Above this a thin stratum of fine sand was laid, conforming, as all the mound strata do, to the convex outline of the lower heap. Then followed a deposit of earth one foot thick, next a thin stratum of sand, then another layer of eighteen inches of earth, a thin and uniform layer of sand somewhat more than an inch thick, another deposit of earth, then a uniform layer of gravel and pebbles to the depth of two feet, and over the whole a final layer of coarse gravel and pebbles one foot in thickness, procured either from the banks of the neigh-

bouring river, or from deep pits surrounding the sacred enclosure; which, as in others of the ancient earth-works, show from whence the materials for their construction were procured. Some of the features here described were peculiar, but the traces of a systematic construction of the sacred mounds in uniform alternate layers of earth and other materials illustrate a feature belonging to the whole class, and one to which nothing analogous in the structure of any of the tumuli or earth-pyramids of the Old World has hitherto been noted.

The investigation of this remarkable class of ancient works suggests many curious questions to which it is difficult to furnish any satisfactory answer. It is probable that not only each successive stage in the use and reconstruction of the altar, but in the building of the superincumbent mound, had its own significance and accompanying rites; and on these future discoveries may yet throw further light. In one of the "Mound City" structures, after penetrating through four successive sand-strata, interposed at intervals of little more than a foot between layers of earth; and excavating altogether to a depth of nineteen feet: a smooth level floor of slightly burned clay was found, covered with a thin layer of sand, and on this a series of round plates of mica, ten inches or a foot in diameter, were regularly disposed, overlapping each other like the scales of a fish. The whole deposit was not uncovered, but sufficient was exposed to lead the observers to the conclusion that the entire layer of mica was arranged in the form of a crescent, the full dimensions of which must measure twenty feet from horn to horn, and five feet at its greatest breadth. After describing the peculiar features of this mound, its explorers remark: "Were we to yield to the temptation to speculation which the presence of

the mica crescent holds out, we might conclude that the Mound-Builders worshipped the moon, and that this mound was dedicated, with unknown rites and ceremonies, to that luminary." It is obvious, at any rate, that very diverse rites were practised, and very different sacrifices offered up to the ancient deities of the Great Valley. In some, the accumulated carbonaceous matter, like that formed by the ashes of leaves or grass, might suggest the graceful offerings of the first-fruits of the earth, so consonant to the milder forms of ancient sacrifice instituted in recognition of the Lord of the Harvest. In others, the accumulation of hundreds of elaborately carved stone-pipes on a single altar, is strikingly suggestive of some ancient peace or war-pipe ceremonial, in which the peculiar American custom of tobacco-smoking had its special and sacred significance, and even perhaps its origin. In others again, we should perhaps trace in the deposition under the sacred mound of hundreds of spear and arrow heads, copper axes, and other weapons of war, the ancient and amply developed ceremonial shadowed forth in the rude Indian symbolism of burying the tomahawk or war-hatchet. But, looking to the evidence which so clearly separates the sepulchral from the sacred mounds, it is scarcely possible to avoid the conclusion that on some of the altars of the Mound-Builders human sacrifices were made; and that within their sacred enclosures were practised rites not less hideous than those which characterized the worship which the ferocious Aztecs are affirmed to have regarded as most acceptable to their sanguinary gods. Among the Mexicans, if we are to believe the narratives of their Spanish conquerors, human sacrifices constituted the crowning rites of almost every festival. That great exaggeration, however, is traceable in the narratives of the chronicles is admitted in part even by the enthusiastic modern historian of the

conquest of Mexico; and the charming historical romance woven by Prescott, is perhaps even more open to question in its reproduction of the gross charges of cannibalism and wholesale butchery in the superstitious rites of the Mexicans: than in its gorgeous picturings of their architectural magnificence, their temples and palaces, sculptured fountains and floating gardens, and all the strange blending of Moorish pomp and luxury, with the refinements of European social manners, and the unreserved freedom of woman.

Without assuming either an Aztec or Northern Indian origin to the race of the Mound-Builders; or discussing meanwhile the essential points of difference from both, which seem to be traceable in such memorials as reveal their characteristics to us; it is undoubtedly in the rites and customs of the various tribes and nations of the New World that we must look for such analogies as may tend to throw light on their mysterious mounds of sacrifice, and other singular remains. In Hariot's narrative of the discovery of Virginia in 1584, he describes the use of tobacco, called by the natives *uppówoc*, and greatly enlarges on its medicinal virtues. He then adds: "This *uppówoc* is of so precious estimation amongst them that they think their gods are marvellously delighted therewith, whereupon sometime they make hallowed fires, and cast some of the powder therein for a sacrifice." The discovery of such unmistakable evidences of one of the sacred altars of "Mound City" having been specially devoted to nicotian rites and offerings, renders such allusions peculiarly significant. In the belief of the ancient worshippers, the Great Spirit smelled a sweet savour as the smoke of the sacred plant ascended to the heavens; and the homely implement of modern luxury was in their hands a sacred censer from which the

hallowed vapour rose with as fitting propitiatory odours as that which perfumes the awful precincts of the cathedral altar, amid the mysteries of the Church's high and holy days.

It is indeed but a vague and partial glimpse that we can now recover of the old worshipper, with his strange rites, his buried arts, and the traces of his propitiatory sacrifices, which the opening of these sacrificial mounds reveals. It is nevertheless a glimpse of a condition of things diverse in many respects from all else that we know of the former history of the New World; and on that account, therefore, the most imperfect disclosures have a fascinating interest for us, greater in some respects than any discoveries relating to the modern Indian can possess. Still more is that interest confirmed by every indication which seems to present the ancient Mound-Builders as in some respects a link between the rude nomade tribes of the American forests and prairies, and those nations whom the first Europeans found established in cities, under a well-ordered Government, and surrounded by many appliances of civilisation akin to those with which they had long been familiar among the most ancient nations of southern Asia. To the great centres of native progress and development which had gathered under Aztec and Inca rule, and to the older seats of American nationality, still abounding with the ruined memorials of their extinct arts, in Central America and Yucatan, the attention of the inquirer into the ancient history of the New World must be finally directed in his desire for some clear comprehension of whatever was essentially native to it. But before turning to those seats of a well-ascertained native civilisation, there still remains for consideration, one other class of the earth-works, of a very peculiar character. They too have a

certain value as a possible link in the detached fragments of ancient chroniclings revealed by such means; lying as they do in geographical, and perhaps also in other relations, immediately between the old region of the Mound-Builders and the miners of the copper regions in the ante-Columbian centuries of the western hemisphere.

CHAPTER XIII.

COMMEMORATION: SYMBOLIC MOUNDS.

AFTER surveying the many remarkable traces of primitive mining, and the germs of native metallurgic arts, which confer so vital an interest on the forest solitudes around the shores of Lake Superior, the attention of the American archæologist is inevitably attracted by the extensive relics of an ancient population in the great river valleys of the Mississippi and its tributaries. But between the regions marked by those diverse features of interest, lies an extensive tract of country, in close contact with the former; and constituting the geographical link that connects it with the area of those ancient mounds, from which so many implements, wrought apparently from the copper of Lake Superior, have been recovered. It has been long known that this territory, which stretches westward from Lake Michigan to the Mississippi, is marked by aboriginal earthworks, of a highly distinctive character and altogether peculiar to the New World. But of this, as of other partially explored regions of the West, the accounts were vague, extravagant, and contradictory; and it is only very recently that the characteristics of its remarkable ancient monuments have been accurately defined. Mr. J. A. Lapham, to whose *Antiquities of Wisconsin surveyed and described,* we owe the minute knowledge of these remarkable earthworks, claims to have first described the Turtle Mound

at Waukesha, as well as other animal effigies of the same territory, so early as 1836. These notices, however, only appeared in local newspapers; and general attention was for the first time directed to them by a paper on the subject, communicated by Mr. R. C. Taylor to the *American Journal of Arts and Sciences*, in 1838, accompanied with illustrations from his pencil. To this and other early descriptions it is due, that this novel class of earthworks at length excited such interest as to lead the American Antiquarian Society to place funds at Mr. Lapham's disposal for enabling him to carry out the elaborate survey and drawings, since published in the *Smithsonian Contributions to Knowledge.*

The occurrence of "Animal Mounds" is by no means exclusively confined to the State of Wisconsin. Some remarkable examples are specially worthy of notice as mingling among the numerous and varied earthworks of the Ohio and Scioto Valleys. But the important fact connected with the aboriginal traces of Wisconsin is that the Animal Mounds constitute its great distinguishing characteristic. They do not occur there interspersed, as in the Ohio Valley, with civic and sacred enclosures, sepulchral mounds, and works of defence; but within an area of well-defined limits, extending between the Mississippi and Lake Michigan, and with its northern and southern boundaries little less clearly traceable: thousands of examples occur of gigantic basso-relievos of men, beasts, birds, and reptiles, all wrought with persevering labour on the surface of the soil. The vast levels or slightly undulating surfaces of that great prairie land, present peculiarly favourable circumstances for the colossal relievos of the native artist; yet not more so than are to be met with in other localities where no such mounds occur. It is important therefore to bear in remembrance that defensive or military structures, and

such as are apparently designed for sacrificial rites or religious ceremonies, are scarcely to be met with in the territory marked by those singular groups of imitative earthworks. It is, moreover, a country well adapted for maintaining a large population, in very diverse stages of social progress. Through the gently undulating surface of the nearly level territory, numerous rivers and streams flow in sluggish, yet limpid current, eastward and westward, to empty themselves into Lake Michigan or the Mississippi. The pools and groups of lakes into which they expand, furnish abundance of wild rice, which is at once a means of sustenance to numerous aquatic birds, and also constituted an important source of supply to the aborigines, so long as the Red Indian held possession of the territory. The rivers and lakes also abound with excellent fish; and where the soil remains uninvaded by the ploughshare of the intruding settler, numerous traces of older agricultural labour show where the Indian cultivated the maize, and developed some of the germs of civilisation, and the industrial arts of a settled people. Indian grave-mounds also diversify the surface, and, in their ornaments and primitive weapons and utensils, disclose traces of the simple arts of the rude nomades that still linger on the outskirts of that western state. But such slight and inartificial sepulchral mounds are readily distinguishable from the remarkable structures of a remoter era which constitute the archæological characteristic of the region. Here indeed, as elsewhere, the Indian has selected the ancient mounds as the most suitable sites for his simpler sepulchral works, thereby more clearly indicating the complete independence of the two.

In describing some of the earthworks near the town of Horicon, on the Rock River, Mr. Lapham speaks of them as at once the most extended and varied groups of

ancient works, and the most complicated and intricate. Of one form of mound which he conceives to represent the otter, seven examples occur; illustrations are given of sixteen cruciform earthworks; and of the ordinary circular mounds about two hundred have been counted. While some of those are small, others are on a gigantic scale. There is one mound of peculiar but indeterminate form, which tapers for a length of five-hundred and seventy feet. At its smaller extremity or tail, it slightly curves to the east. At its opposite extremity or head, there occurs a large cross, and one of the largest circular mounds. One figure is named appropriately enough, "The Tobacco-Pipe Mound," from its obvious resemblance to that characteristic American implement. In several of the mounds of another group the surveyors noticed recent Indian graves, covered with slabs or stakes, in accordance with the usual method of Indian burial, and belonging to the Potawattomies; and Mr. Lapham adds: "The larger and more conspicuous mounds are generally selected by the Indians for the burial of their dead."

The sites of these ancient works closely correspond to those adopted by the Mound-Builders of the more southern river-valleys. Within the well-watered region enclosed by the great lakes, and bounded on the west by the Mississippi, a numerous population may have long lain undisturbed, in the enjoyment of the profusion which wood and water and the easily cultivated soil supplied. On the bluffs and terraces surmounting the rivers and lakes, where game abounded, and by means of which facilities of communication with the surrounding territory, and with more distant regions, were commanded, the earthworks are found in extensive and evidently dependent groups. But, unlike the rich memorial mounds of the Scioto Valley, the Wisconsin earthworks reveal

scarcely any enclosed relics to chronicle the history of their erection, and throw a light on the mysterious race of artists who laboriously recorded such hieroglyphics on the broad canvas of the natural landscape. In a few cases, human remains have been found in the emblematic mounds, under circumstances which did not clearly point to a modern date; but these are quite exceptional. In summing up the results of his exploration of the Wisconsin earthworks, Mr. Lapham remarks:—"So far as I have had opportunity to observe, there are no original remains in the mounds of imitative form, beyond a few scattered fragments that may have gained a place there by accident. Many of the mounds have been entirely removed, including the earth beneath for a considerable depth, in the process of grading streets in Milwaukee; and it is usually found that the natural surface had not been disturbed at the time of the erection, but that the several layers or strata of mould, clay, gravel, etc., are continuous below the structure, as on the contiguous grounds. Great numbers of the smaller conical tumuli are also destitute of any remains; and if human bodies were ever buried under them, they are now so entirely 'returned to dust' that no apparent traces of them are left. If we assume that each mound was a place of burial, we must infer, from the absence of utensils, that the common practice of depositing with the dead the implements to be used in the other world, is of comparatively recent origin, since some of these, at least, would have resisted decay."[1]

The great earthwork figures, wrought in relievo on the surface of the Wisconsin soil, include among their devices the lizard, turtle, elk, buffalo, bear, fox, otter, racoon, and other animals. Such, at least, are the designs which modern fancy has traced in those novel works of primi-

[1] *Antiquities of Wisconsin*, p. 80.

tive art. The frog also appears to be imitated; birds and fishes are repeatedly represented; and man himself figures among the strange groups. Nor are the imitations confined to animate subjects, though the prevalence of these has suggested the designation of "animal mounds," as suitable for the whole. Embankments also occur in the form of crosses, crescents, angles, and straight lines; and also seemingly as the gigantic imitations of the war-club, tobacco-pipe, and other familiar implements or weapons. Some, at least, of the crosses and other simpler forms, in all probability, originally represented animals, birds, or fishes, with extended wings or fins. In these, as in the better-defined animal mounds, time has doubtless obliterated the minuter and more characteristic touches of the ancient modeller, and effaced the indications of his original meaning.

One of the most remarkable groups occurs about eighteen miles west of the "Four Lakes," in Dade County, Wisconsin; and includes six quadrupeds, six parallelograms, one circular tumulus, one human figure, and a small circle. This conspicuous group is situated on the great Indian trail from Lake Michigan to the Mississippi, and is figured and described in *Silliman's Journal*, by Mr. R. C. Taylor, from actual survey. It is again figured and described, along with other examples of the monuments of the North-west, in Messrs. Squier and Davis's *Ancient Monuments of the Mississippi Valley;* but neither from figures nor description can any more definite idea be drawn, than that the group includes representations of quadrupeds, varying in size from ninety to one hundred and twenty feet, but either so rudely executed, or so much defaced, that they may be "buffalos," or "bears," or indeed any other animals. They are grouped in two rows on the surface of a high, open prairie, on the dividing ridge between the Rock

and Wisconsin Rivers. Midway in the group, an elevated conical mound overtops the whole, and affords the only point from whence the entire group can be surveyed. It appears probable, indeed, that such a mound was purposely erected as an observatory from whence to view the whole. In many of the groups, it can scarcely admit of doubt that the original relation of the several members was something more than mere juxtaposition; but an ingenious critic, in reviewing the work of Messrs. Squier and Davis, thus outstrips their attempts at interpretation of the dubious "bears" or "buffalos:"—"It occurs to us that the group is a very intelligible representation of a sledge with its rider, and a train of six dogs, wheeling round the conical mound, which last action is particularly represented by the last animal being in a position almost at right angles with the man, behind whom are the oblongs to represent the vehicle, and also with the remainder of the animals. Taking the rudeness of the age and workmanship into account, the impracticability of the material, and the scale and material, the whole is really not a bad representation of the dog-drawn sledges of the Kamschatdales of the present day. Supposing their horns to have been omitted, from the impracticability of raising earthworks that would stand well, and in proportion to represent them, they might have signified the elk or the reindeer. Whatever animal, however, be taken, it is perhaps a legitimate inference that we have here the colossal trophy of a successful super-Atlantic charioteer at some American race; why not the curious hippodrome, or, more correctly here, cynodrome, with its starting-cells, its course, its meta, and road of triumph to the town?"[1]

It was not necessary for the fanciful interpreter of the

[1] *Journal Brit. Archæol. Association*, vol. v. p. 411.

Wisconsin earthworks to resort to remote Kamschatka for the model of his dog-drawn sledge, for such are common enough among the Indians of the North-west; but basso-relievos that admit with equal probability of their determination as buffalos, bears, dogs, or elks, yield little trustworthy disclosures; and a general survey of the earthworks of Wisconsin in no degree tends to confirm such modes of interpretation. But while rejecting this classical reading of the emblematic mounds of the West, it is not because of their rude representations appearing to be unfit memorials of any triumph analogous to those for which trophies were reared in the classic arena. Fully to appreciate the magnitude of the Dade county group, we must bear in remembrance the proportions of the supposed charioteer. He is figured, as is usual in similar mounds, with his limbs extended, and with arms of disproportionate length; possibly owing to the design originally representing some implement in each hand. From head to feet he measures one hundred and twenty-five feet, and one hundred and forty feet from the extremity of one arm to that of the other. The head alone is twenty-five feet in diameter, and nearly six feet in highest elevation from the surrounding soil. Measuring the whole by this scale, it is abundantly apparent that a group, including altogether sixteen different mound-figures, must have been a work of immense time and labour, and doubtless owed its origin to some motive or purpose of corresponding magnitude in the estimation of its constructors.

Mr. Schoolcraft, to whom no problem of America's prehistoric times appears to suggest any insoluble difficulties, deals with the emblematical mounds of Wisconsin in greater seeming consistency with the aboriginal mode of thought of the New World. In the first volume

of his *History of the Indian Tribes,* he solves the whole mystery by assuming them to be merely the Totems, or heraldic symbols in use among the Indian tribes, thus reproduced in earthworks on a gigantic scale. "The connexion," he remarks, "of the animal mounds of Wisconsin with the existing totemic system of the Indians who are yet on the field of action, is too strong to escape attention. By the system of names imposed on the men composing the Algonquin, Iroquois, Cherokee, and other nations, a fox, a bear, a turtle, etc., is fixed upon as a badge or stem, from which the descendants may trace their parentage. To do this the figure of an animal is employed as a heraldic sign or surname. This sign is called in the Algonquin, town-mark or totem. A tribe could leave no more permanent trace of an esteemed sachem, or honoured individual, than by the erection of one of these monuments. They are clearly sepulchral, and have no other object but to preserve the names of distinguished actors in their history."[1] Thus by the aid of superficial resemblances all mystery and difficulty are evaded. But, meanwhile, the explorations of Mr. Lapham seem to prove that the emblematical mounds of Wisconsin are not sepulchral; while any correspondence that may be traced between the totemic symbols of tribes once as widely spread as the Algonquin, Iroquois, and Cherokees, only increases the mystery of such ancient symbols, constructed on this colossal scale, and confined to a territory so limited and well defined. So far indeed is a careful survey from confirming any such convenient and summary fancy, that Mr. Lapham states as the result of his elaborate exploration of the earthworks of Wisconsin, that he conceives four epochs are traceable in the history of the locality, two of which at least preceded the era of occupation by the Indian tribes.

[1] *History of Indian Tribes,* vol. i. p. 52.

There is the period of the animal Mound-Builders, strangely devoid of works of art, though one or two exceptional cases have been met with, as at Racine, where Dr. Hoy describes the finding of a deposit of disks of hornstone, about thirty in number, which appear to correspond in description to similar deposits in the more southern mounds. Again, the extensive works at Aztalan, on the west branch of the Rock River, present considerable analogies to the sacred and civic enclosures of the Mound-Builders of Ohio. The Aztalan earthworks constitute, it is believed, the only ancient enclosure, properly so called, throughout the whole region of the emblematic mounds; and, under the name of the "ancient city of Aztalan," it was long regarded, from extravagant and grossly exaggerated descriptions, as one of the wonders of the western world. The name was given to it by its first surveyor, N. F. Hyer, in the belief that here possibly were the remains of a city of that northern Aztalan, from whence, according to the traditions of the Aztecs, the ancestors of the Mexican people derived their origin. On such a basis, credulity and wilful exaggeration soon reared magnificent western ruins. Walls of brick still sustained by their solid buttresses; a subterranean vault and stair-way discovered within one of its square mounds; a subterranean passage, arched with stone; bastions of solid masonry, and other features of the like kind, were all made to correspond with the supposed mother-city of the Aztecs, and the cradle-land of America's native civilisation. On being subjected to accurate survey, all these wondrous features vanish like the cloud-castles of the dawn before the sun. Freed, however, from such exaggeration and falsehood, the Aztalan works still present very remarkable characteristics. An area of seventeen acres on the banks of the Rock River is enclosed on three sides by earth-

works; but the form of these is peculiar, consisting of a series of "bastions" as they have been termed, although both the construction of the walls, and the site of the enclosure—commanded as it is by elevated land on nearly every side,—preclude the idea of its having ever been used as a place of defence. Large, square, terraced mounds occupy the northern and southern angles within the enclosure, and in the former of these there was found, several feet below the surface, what appeared to be the remains of cloth enveloping portions of a human skeleton. Its texture was open like the coarsest linen fabric, but the threads were so entirely rotten as to make it uncertain of what material they were made. It is not probable, however, that either this, or numerous fragments of pottery taken from the mounds at different times, bear any relation to the original builders of Aztalan. Careful and elaborate excavations by more recent explorers have been equally fruitless with those carried on in the symbolic mounds; and cuttings made in some of the largest of a remarkable range of tumuli outside the enclosures, revealed only ashes, mingled with charcoal and fragments of human bones, at various depths; but brought to light no single work of art, like those which confer so graphic an interest on the mounds of the Ohio Valley.

Assuming the great works of Aztalan and the animal mounds of Wisconsin to belong to the same period: Mr. Lapham regards the conical mounds as built for sepulchral purposes, and exhibiting, both in construction and materials, the workmanship of a greatly inferior race of builders, pertaining to a later era. Next come what are designated by the modern settlers "ancient garden beds." They consist of low, broad, parallel ridges, as if corn had been planted in drills. They average four feet in width, twenty-five of them having been counted in the space of

a hundred feet, and the depth of the walk between them is six inches. These appearances indicate a more perfect system of agricultural operations than anything known to have been practised by the modern Indian tribes; but, at the same time, they are no less distinctly disconnected with the construction of the ancient mounds. Where these occur within a cultivated area, the parallel ridges of the old cultivators are carried across them in the same manner as over any undulation in the adjacent ground. It is obvious, therefore, that the emblematic earthworks had neither sacredness nor any special significance in the eyes of those later cultivators of the soil. Probably, indeed, such traces of agricultural operations belong to a greatly more modern period than that of the mounds.

The ancient monuments of this territory, lying immediately to the south of the great copper region of Lake Superior, present very remarkable features. If we assume the existence of nations or tribes in Wisconsin and Ohio contemporary with the Mound-Builders, the chronicles of that prehistoric era exhibit them to us in striking contrast. In the one, every convenient height is crowned with the elaborate fortifications of a numerous and warlike people; while, on the broad levels of their river-terraces, ingenious geometrical structures prove their skill and intellectual development as applied to the formation of their civic and temple enclosures. Their sacred and sepulchral mounds, in like manner, reveal a highly-cultured artistic skill, and a singular variety in the rites and customs once exacted in the performance of their national worship. Turning to the northern area, all is changed. Along the river-terraces we look in vain for military structures, and, with one remarkable exception, for sacred enclosures. The mounds disclose no altars rich with the metallurgic and mimetic arts of

their builders; but, on the contrary, the sole traces of imitative art are exhibited in the external forms of earthworks, the exploration of which confutes the idea of their having been constructed over either grave or altar, and reveals no other purpose connected with their origin.

When it is considered that the sacred and sepulchral mounds, abounding throughout the valleys of the Mississippi and its tributaries, frequently contain the copper of Lake Superior and the mica of the Alleghanies, as well as the shells of the Gulf of Mexico, and obsidian from the ancient centre of American civilisation to the west of that tropical sea: we are tempted to trace some intimate relations between the warlike occupants of the Ohio and Scioto valleys, and the singular race who dwelt in peaceful industry on the well-watered and plentifully stocked plains to the south of the great copper region, and reared, along its lake and river terraces, the strange colossal memorials of their imitative art. The country seems peculiarly adapted by nature as a central neutral land for the broad continent to the east of the Rocky Mountains. On the north it is guarded by the vast fountain of the great lake and river chain, which, with Lake Michigan on its eastern boundary, sweeps away on its course of twenty-five hundred miles of lake and river, over the mighty leap of Niagara, and through the islands and rapids of the St. Lawrence, into the Atlantic; and on the west, with its infant streamlets originating almost from the same source, the Mississippi rolls onward in its majestic course, receiving as its tributaries the great rivers which rise alike on the western slope of the Alleghanies and the eastern declivities of the Rocky Mountains, and losing itself at length in the Gulf of Mexico. This wonderful river-system, and the great level contour of the regions which it drains, exercised a remarkable

influence on the extinct civilisation of America, as well as on her later Indian nomade life, making it so different from any of the old or newer centuries of Europe's history. The Indians who traded with Cartier at Tadousac, on the lower St. Lawrence, and those whom Raleigh met with on the southern coast of Carolina, obtained their copper from the same northern region towards which the head-waters of the Mississippi and the St. Lawrence converge; while the world of Europe between the Rhine and the Baltic remained, even in its late Roman era, almost as much apart from that on its Mediterranean shores as the America of centuries before Columbus. It seems, therefore, not inconceivable that this central area of the continent derives some of its archæological characteristics from the ancient recognition of its relation to the physical geography of the region between the Rocky Mountains and the Atlantic. Was it indeed, as has been suggested, a sacred neutral ground attached to the metallurgic region of Lake Superior, like the famous pipe-stone quarry of the Couteau des Prairies? or was it in the possession of a tribe like the Levites of ancient Palestine, recognised by others as consecrated to religious services and the rites of peace? Who shall venture to lift the curtain, which is itself the sole picture visible to our eyes? Future disclosures may, indeed, greatly enlarge our knowledge; but meanwhile we must be content to limit speculation to the confines of existing evidence, and aim at clearly discriminating between fact and fancy.

While, however, the symbolic or animal mounds are characteristic of ancient Wisconsin, examples of them are intermingled among the other earthworks of the Mississippi Valley; and some of them, indeed, present there their most remarkable specialities. One of these, in Scioto County, Ohio, is described from a survey and

notes by Mr. Charles Whittlesey. On a high level terrace on the west bank of the Scioto River, an oval embankment, approaching very nearly to a true ellipse, has been constructed with unusual care. Its longest axis is four hundred and eighty feet, and its conjugate diameter four hundred and seven feet. A single gateway, opening to the south-east, and about ninety feet wide, breaks the continuity of the embankment: but it is covered by a long exterior mound, leaving an approach at either end, where it overlaps the inner oval. Within this enclosure is a large animal-shaped mound, resembling those of Wisconsin, excepting in this that none of them have hitherto been observed to be enclosed by corresponding earthworks. The Ohio Canal passes close to the site, and its engineer has noted the interesting fact that, in the progress of its excavation, the workmen found, in the immediate vicinity of this ancient enclosure, large quantities of mica in sheets, similar to what has been met with so abundantly in the sacrificial mounds.

The same canal intersects the works of one of the most remarkable of the sacred enclosures already referred to: the Newark group, in Licking County, Ohio; and here, within an elliptic enclosure of 1250 feet in its longest axis, is the great bird-mound, measuring 155 feet in length of body, and 200 feet between the tips of the wings. As already described, it constitutes only one of many striking features of a remarkable group of geometrical enclosures, mounds, and avenues; but it is distinguished from all the other works around it, covering an extent of about two miles square, by the great height of the enclosing walls, and the peculiar feature of an interior ditch seven feet deep and thirty-five feet wide. In the centre of an area of thirty acres, enclosed by imposing circumvallations, and under the shadows of gigantic trees, hoary with the years of many generations,

rises this remarkable bird-mound, with its head pointing directly to the eastern avenue; while immediately in its rear, one hundred feet distant, is a semicircular embankment of slight elevation, about two hundred feet in length. This bird-mound, as previously observed, has been opened, and found to cover a sacrificial altar, but unfortunately no note has been preserved of any relics discovered within it. The fact, however, is of great importance, in comparing the works of the Mississippi Valley with those of Wisconsin; which, in the absence of any included relics of worship or inhumation, seem but as the typical symbols of the rites and practices of the southern Mound-Builders.

The Newark Valley abounds with military and sacred enclosures, embankments, altar-mounds, and tumuli of the ancient people; and about six miles higher up the valley, the "Alligator," of Licking County, attracts our attention as a remarkable example of the colossal animal-mounds of the New World. A hill or headland, from 150 to 200 feet in height, projects boldly into the valley of Racoon Creek, and on the rounded summit of this headland the huge lizard-mound has been constructed. The summit of the hill upon which the effigy rests is so regular as to suggest the idea that it has been artificially rounded; as is by no means improbable, in the process of excavating the materials out of which the mound is formed.

In this, as in other examples of animal-mounds, the probability is suggested that it may have been originally modelled with a minuteness of detail very imperfectly preserved in its present condition. The outline of the figure is clearly defined. Its average height is fully four feet, but the head, shoulders, and rump are elevated in some parts to a height of six feet, an attempt having evidently been made to preserve the contour and rela-

tive proportions of the animal represented. The ends of the paws are broader than the limbs, as if the spread of the toes had been originally indicated, and the tail curves off to the left side, so as to give its full length within the limits of its elevated site. The total length from the point of the nose to the end of the curved tail is about 250 feet. Upon the inner side of the effigy is a raised circular space, covered with stones which have been much exposed to the action of fire; and from the summit of this, which is designated the altar, a graded way, ten feet broad, leads to the top of the Alligator Mound. Excavations made at various points of the figure have only sufficed to show that its framework is composed of stones of considerable size, upon which the superstructure has been modelled in fine clay.

The site of this remarkable ancient monument commands a view of the entire valley for eight or ten miles, and is by far the most conspicuous point within that limit. It overlooks a beautiful circular enclosure in the valley immediately opposite. An ancient fortified hill stands about three-fourths of a mile distant on a spur of the same range of heights; and another entrenched hill nearly faces it on the opposite side of the valley. Numerous mounds are seen from it both on the hill-tops and in the level bottom; and it is only the luxuriant growth of the still uncleared forest which conceals the great Newark group, with its numerous geometrical enclosures, parallels, and mounds. It is apparent, therefore, that the site of this singular symbolic earthwork was selected as the most prominent natural feature, in a valley abounding with traces of the military, civic, and religious structures of that strange extinct race to whom we give the name of the Mound-Builders; and in one of the most populous centres of ancient settlement. It is not, therefore, without good reason that its surveyors have assumed that the

Alligator Mound of Newark Valley had its origin in the superstitions of its makers; and that it was perhaps the high place where sacrifices were made on stated or extraordinary occasions, when that ancient people gathered to celebrate the rites of their now unknown worship.

But by far the most remarkable of all the symbolic or imitative earthworks hitherto discovered is "the Great Serpent," of Adams' County, Ohio. At the junction of a small rivulet with Bush Creek, a tributary of the Ohio, a crescent-formed spur of land has been left between the two water-courses, rising abruptly from the level of the stream to a height of 150 feet. At the extreme point of the promontory is an oval earthwork of perfectly regular outline, measuring 160 feet in greatest diameter, and eighty feet, or exactly one-half, in least diameter. A circular heap of large stones, marked strongly by the action of fire, formerly occupied the centre, but its site is now indicated only by a slight elevation. The point of the hill on which this oval earthwork rests appears to have been cut to a conformity with its outline, leaving a smooth external platform ten feet wide, with an inclination towards the embankment on every side. Immediately outside the inner point of this oval enclosure is the Great Serpent's head, with distended jaws, as if in the act of swallowing what, in comparison with its huge dimensions, is spoken of as an egg, though it measures, as has been said, 160 feet in length. Conforming to the summit of the hill, the body of the serpent winds back for 700 feet, in graceful undulations, terminating with a triple coil at the tail. The figure is clearly and boldly defined, the earth-wrought relievo being upwards of five feet in height by thirty feet in base at the centre of the body, and diminishing towards the head and tail. The entire length, following its convolutions, cannot measure

less than a thousand feet. On either side of the serpent's head two small triangular elevations extend, looking on the ground-plan like external gills, but they are so much obliterated as to render their original form uncertain. Unlike the great Alligator Mound, this remarkable monument stands alone. With the exception of a single mound of moderate dimensions in the centre of the isthmus, connecting its elevated site with the table-land beyond, the spectator looks forth from the commanding point it occupies over an extensive prospect, with broad alluvial terraces spread out below, but all unoccupied by the ancient works which generally abound in that region on similar sites.

This singular monument of extinct rites and faith, though classed here with the symbolic animal-mounds of Wisconsin, has no analogue among the numerous basso-relievos wrought on the broad prairie-lands of that extensive region. It is indeed altogether unique among the ancient earthworks of the New World, and without a parallel in the Old, though it has not unnaturally furnished the starting-point for a host of speculations relative to the serpent-symbols of Egypt, Assyria, and Greece; the supposed symbolism of Celtic superstitions in the monolithic temples of Avebury and Carnac; and the serpent in combination with the circle, egg, and globe, among the predominant symbolic devices on the most ancient temples of Egypt and India, as well as on those of Central America. Mr. Squier has devoted a special volume to the working out of this fascinating subject of "the Serpent Symbol" in its New World aspects; but his ingenious speculations do not lead to more tangible results than those which employed the fanciful pen of Stukely, or delighted Toland and Davis in the belief that they were fathoming the mysteries of the Celtic Druids.

One other class of imitative works occurs among the strange symbolic mounds of Wisconsin, presenting some analogy to those still remaining among the primitive monuments of the British Isles. The earthworks hitherto described are in bold relief, and among the more important groups there frequently occurs an elevated mound or observatory from whence to overlook and take in the full design of the whole. But on the Indian prairie, a few miles from the city of Milwaukee, amid an interesting series of imitative and other mound-works, there occur five others, wrought — to use the terms of European art — in intaglio. Instead of the representations of animals being here executed by modelling them in relief on the level surface of the soil, the process has been reversed, and after forming them by excavation, the earth removed by this means has been piled in regular mounds around the edge. A few other examples of this intaglio work have been noted; but such a process, if ever very extensively used, must have been much more liable to effacement in the process of time, unless protected and preserved, like the famous "White Horse" of Berkshire, by a periodical "scouring," which has there survived as a custom long after less faithful tradition has preserved with any certainty the memory of the events it was designed to commemorate. The chalk hills of southern England present peculiar facilities for such effective colossal intaglio work. Another White Horse, ascribed to Saxon victors of the Danes, accompanies an interesting group of British earthworks on Braddon Hill, Wiltshire; and the colossal human figure, armed with a club, at Cerne, in Dorsetshire, preserves a curious counterpart to those scattered over the prairie lands beyond the western shores of Lake Michigan.

It is difficult to convey by mere description, even though accompanied with minutest measurements, a de-

finite conception of the great scale upon which the American earthworks are executed, and the consequent labour involved in their construction. One of the cruciform mounds, for example, measures 420 feet between the extreme points of its limbs. Lizard and other animal-mounds range from 80 to 150 feet in length, and are met with in groups, involving altogether long and continuous labour. The native American tribes that have come under the direct observation of Europeans, are as diverse in habits, arts, and religious rites as in language; but none of them have manifested the capacity for continuous labour involved in the construction of monuments which more nearly resemble the great embankments and viaducts of modern railway engineering. The extent of such works, like those in the more southern valleys, indicates a settled condition of society, with a systematic agricultural industry, very different from that of the Iroquois Confederacy. Agriculture must have been sufficiently developed to maintain a considerable population; and though in all this there is nothing absolutely incompatible with the idea of the modern Indian being the degenerate descendant of such a people, yet it is a mere idea, alike improbable and unsupported by proof. No modern tribe hitherto discovered preserves any trace of such ancestral constructive habits; and while the animal-mounds appear to be regarded with superstitious reverence by the Indians, and are never disturbed by them except for purposes of sepulture, they lay no claim to them as the work of their fathers. Their only theory of the origin of such structures is, that they are the work of the great Manitou, and were made by him to reveal to his red children the plentiful supply of game that awaits them in the world of spirits. The idea is a consoling one to the tribes whose hunting-grounds have there been invaded and laid desolate; and it is

fully as philosophical as the theory gravely propounded, in my hearing, before one of the sections of the American Scientific Association, that the cruciform and curvilinear earthworks intermingled with the animal-mounds, include various characters of the Phœnician alphabet, and are half-obliterated inscriptions commemorative of the ancient exploration of the American lake regions by the great voyagers of antiquity!

CHAPTER XIV.

PROGRESS: NATIVE CIVILISATION.

THE name of the Toltecs plays a part in the initial pages of the New World's story akin to that of the fabled Cyclops of antiquity. It belongs to that vague era which lies beyond all definite records, and furnishes a name for the historian and the ethnologist alike to conjure with: like the Druids or the Picts of the old British antiquary, or the Phœnicians of his American disciple. Yet it is not without its value thus to discover, among the nations of the New World, even a fabulous history, with its possible fragments of truth embodied in the myth. Mr. Gallatin has compiled a laborious digest of the successive migrations and dynasties of Mexico, as chronicled from elder sources, by Ixtlilxochitl, Sahagun, Veytia, Clavigero, the Mendoza Collection, the Codex Tellurianus, and Acosta.[1] The oldest dates bring the Toltec wanderers to Huehuetlapallan, A.D. 387, and close their dynasty in the middle of the tenth century; when they are superseded by Chichimecas and Tezcucans, whose joint sovereignty, by the unanimous concurrence of authorities, endures till the sixteenth century. But, meanwhile, the same authorities chronicle the foundation of Mexico or Tenochtitlan, variously in the thirteenth or fourteenth century, by the Aztec conquerors, and profess to supply the dynastic chronology of Aztec power. The earliest date is not too

[1] *American Ethnological Society's Transactions*, vol. i. p. 162.

remote for the commencement of a civilisation that has left such evidences of its later maturity; but unfortunately the various authorities differ not by years only, but by centuries. Ixtlilxochitl carries back the founding of Mexico upwards of a century farther than any other authority; and in the succeeding date, which professes to fix the election of its king, Acamapichtli, the discrepancies between him and other authorities vary from two to considerably more than two and a half centuries; and leave on the mind of the critical student, impressions nearly as substantial as those pertaining to the regal dynasties of Alban and Sabine Rome. Spanish chroniclers, and modern historians and ethnologists, have striven to piece into coherent details the successive migrations into the Vale of Anahuac from the north, and the desertion of the mythic northern Aztalan for the final seat of Aztec empire in the lake of Tezcuco; but their shadowy history marshals before us only shapes vague and immaterial as those which Turner's pencil called into being in response to the poet's dream, "from many an age withheld," of kingly splendours of the engulfed Atlantis.[1]

There is something at once amusing, and singularly suggestive of doubt relative to much else that is greatly more modern, to find the gifted American historian of the Conquest of Mexico tracing down the migrations and the conquests of the Toltecs from the seventh till the twelfth century, when the Acolhuans or Tezcucans, the Aztecs, and others, superseded them in the Great Valley. We turn to the foot-notes, so abundant in the carefully elaborated narrative of Prescott, and we find his chief or sole authority is the christianized half-breed of Tezcuco, De Alva, or Ixtlilxochitl, who held the office of Indian interpreter of the Viceroyalty of New Spain in

[1] Rogers' *Voyage of Columbus.*

the beginning of the seventeenth century.[1] Compared with such an authority, Bede should be indisputable as to the details of Hengist and Horsa's migrations, and Geoffrey of Monmouth may be quoted implicitly for the history of Arthur's reign.

But the Aztecs or ancient Mexicans, at any rate, are no mythic or fabulous race. The conquest of their land belongs to the glories of Charles V., and is contemporary with what Europe reckons as part of its modern history. The letters of its great conqueror are still extant; the gossiping yet graphic marvels of his campaigns, ascribed to the pen of Bernal Diaz, a soldier of the Conquest, have been diligently ransacked for collation and supplementary detail; and the ecclesiastical chroniclers of Mexican conquest and colonization, have all contributed to the materials out of which Prescott has woven his fascinating picture of Fernando Cortes and his great life-work. It is a marvellous historical panorama, glittering with a splendour as of the gorgeous mosques and palaces of Old Granada; but a growing inclination is felt to

[1] By a clerical error in the notes appended to Prescott, *Conquest of Mexico*, B. I. ch. vi., Ixtlilxochitl is spoken of as belonging to the beginning of the sixteenth century; but the error is obvious. The American historian fully acknowledges at times the utter worthlessness of his authorities. Nevertheless this has not prevented him from constructing, out of the materials they have furnished, a coherent narrative of ancient migrations, and the relative civilisation of primitive races, from the seventh to the fifteenth century; although of so much of the corresponding era of Europe we have still to speak of centuries of vague or fabulous obscurity. "Clavigero," says Prescott, "talks of Boturini's having written 'on the faith of the Toltec historians.' But that scholar does not pretend to have ever met with a Toltec manuscript himself, and had heard of only one in the possession of Ixtlilxochitl. The latter writer tells us that his account of the Toltec and Chichemec races was 'derived from interpretation' (probably of the Tezcucan paintings), 'and from the traditions of old men;' poor authority for events which had passed centuries before. Indeed, he acknowledges that their narratives were so full of absurdity and falsehood, that he was obliged to reject nine-tenths of them. The cause of truth would not have suffered much, probably, if he had rejected nine-tenths of the remainder."—*Conquest of Mexico*, B. I. ch. i. note 12.

test the Spanish chroniclers by the surviving relics of that past which they have clothed for us in more than oriental magnificence. Specially do we desire to look with clear, critical vision on that curious phase of native American civilisation, which was abruptly arrested and quenched, like an extinguished torch, under the heel of the conqueror. Yucatan and Central America still reveal to us indisputable memorials of a long-extinct era of native architectural skill, and to these monuments of a mysterious past our attention must be directed with earnest care. But, meanwhile, it is important to note that a correspondence in probable origin, and in actual style and characteristics, between much of the architecture of Central America and that which is affirmed or assumed to have existed in Mexico at the time of the Conquest, is made to constitute the basis of many fallacious arguments on the nature and extent of Aztec civilisation in the era of the second Montezuma. Again, the conflicting elements apparent between the barbarous rites and cannibalism affirmed by their conquerors to have been practised by the Aztecs, and the evidences of matured arts and high civilisation ascribed to them, have been the plentiful source of theories as to Toltecan and other earlier derivations, for all that pertained to such manifestations of intellect, taste, and inventive genius. But what we are specially desirous of testing at present, is the character of Mexican architecture. The mysterious works of the extinct Mound-Builders are full of wonder for us, but the magnificence of the capital of Montezuma throws their simple earthworks into the shade; and, while reading with implicit faith the narrative of its conqueror, we feel that the age of America's infancy and childhood lies all buried in the older mounds. Before, however, this conclusion can be accepted, it is indispensable that we test, by existing

evidence, the descriptions of Mexican art and architecture handed down to us by the chroniclers of the sixteenth and seventeenth centuries.

A peculiar style is recognised as pertaining to the native architecture of America, which, if not independently originating on the soil of the New World, it has been the favourite fancy of American antiquaries to trace to an Egyptian or a Phœnician source. Alike in their general character and mode of construction, in the style of sculpture and the hieroglyphic decorations which enrich their walls: the ruined palaces and temples of Mexico, as well as of Yucatan and Central America, have been supposed to reproduce some of the most striking characteristics of the Nile valley. But the experienced eye of Stephens saw only elements of contrast instead of comparison; and while Prescott sums up his history of Mexican conquest with this conclusion, "that the coincidences are sufficiently strong to authorize a belief that the civilisation of Anahuac was, in some degree, influenced by that of eastern Asia," he adds, that the discrepancies are such as to carry back the communication to a period so remote as to leave its civilisation, in all its essential features, peculiar and indigenous. Searching, on an earlier page, for any specific proofs that seemed to justify the analogies which command the greatest popularity, the historian remarks:—"The points of resemblance will probably be found neither numerous nor decisive. There is, indeed, some analogy both to the Egyptian and Asiatic style of architecture, in the pyramidal, terrace-formed bases on which the buildings repose, resembling also the Toltec and Mexican teocalli. A similar care also is observed in the people of both hemispheres to adjust the position of their buildings by the cardinal points. The walls in both are covered with figures and hieroglyphics, which, on the

American as on the Egyptian, may be designed perhaps to record the laws and historical annals of the nation. These figures, as well as the buildings themselves, are found to have been stained with various dyes, principally vermilion; a favourite colour with the Egyptians also, who painted their colossal statues and temples of granite. Notwithstanding these points of similarity, the Palenque architecture has little to remind us of the Egyptian or of the Oriental."[1] And we must add, that even these analogies are very partially true, and can only be carried so far by ascribing to Mexican civilisation works which probably had a totally distinct origin. For if the gifted historian of the Conquest of Mexico had to employ other eyes to give to the world the attractive and glowing pictures wrought by his fancy and judgment from manuscript treasures, gathered alike from the old colonial empire of Spain, and from the public archives of the Peninsula: we may feel the less hesitation in testing, by a severe standard of criticism, the proofs on which so many of our ideas are founded relative to the native-born civilisation of Mexico, and of America at large. It is indeed difficult to determine what we are to believe relative either to the former or the present characteristics of some of the most famous monuments of Mexican art. The ruined city of Aztalan, on the western prairies, after filling the imagination with glowing fancies of a desert Baalbek or Palmyra of the New World, from whence the Aztecs had transplanted the arts of an obliterated civilisation to the Mexican plateau; shrunk before the critical gaze of a truthful surveyor into a mere group of mounds and earthworks: curious, indeed, and replete with strange interest; but presenting no other analogies than those which class them with the works of the American Mound-Builders. Yet it is strange how enduring such cloud-

[1] Prescott's *Conquest of Mexico*, Append. part I.

built structures will often prove. The pride of local prejudice becomes enlisted on behalf of the current tale of exaggeration; the stereotyped phraseology which speaks of earthen mounds and clay ramparts as pyramids, bastions, and buttressed walls, perpetuates the extravagant hyberboles of their first discoverers; and, but for some timely and well-authenticated survey, it is left to later generations to sift painfully the vague and contradictory fables of a past that never had a present. The literal Aztalan, on the banks of the Rock River of Wisconsin, but poorly corresponds to the received ideas of that northern Aztalan, to which Mexican traditions and hieroglyphical maps alike pointed as the bright abode of a warlike ancestry, glorious as the sons of the Titans, or the offspring of the Teutonic Odin. It may be, however, that a like critical survey will reveal to us such traits in the later Aztecs of Anahuac, as to render such an ancestral birth-land less inconsistent with their actual condition when brought into fatal contact with the higher civilisation of Europe. Such at least seems to be the tendency of modern disclosures, if, indeed, they do not point to the possibility that much even of the latest phase of Mexican civilisation may present some closer analogies to the actual ruined Aztalan of the Wisconsin prairies, than to the fancied mother-city of the Aztecs.

Midway across the continent of North America, where it narrows towards a point between the Gulf of Mexico and the Pacific, the civilisation of the New World appears to have converged at the close of the fifteenth century. Here the traveller from the Atlantic coast, after passing through the gorgeous tropical flowers and aromatic shrubs of the deadly *tierra caliente,* emerges at length into a pure atmosphere. The vanilla, the indigo, and flowering cacao-groves are gradually left behind. The sugar-cane and the banana next disappear; and he looks

down through the gorges of the elevated *tierra templada* on the vegetation of the tropics, carpeting, and scenting with its luscious but deadly odours, the burning region which stretches along the Mexican Gulf. Higher still, he climbs into regions where the wheat and other grains of Europe's temperate zone replace the tall native maize or Indian corn; until at length he enters the *tierra fria:* climbing up through a succession of terraces representing every zone of temperature, till he rests on the summit of the Cordillera. Beyond this the volcanic peaks of the Andes tower into the regions of perpetual snow; while the traveller crosses the once thickly-wooded table-land into the celebrated valley of Mexico: an oval basin about sixty-seven leagues in circumference, and elevated beyond the deadly malaria and enervating heat of the coast into a temperate and fertile climate, nearly seven thousand five hundred feet above the equidistant Atlantic and Pacific Oceans. Here, encompassed by the salt marshes of the Tezcucan Lake, stood the ancient Tenochtitlan or Mexico, "The Venice of the Aztecs."

In the month of October 1519, Don Diego de Ordaz effected the ascent of the volcanic Popocatepetl, which stands with Iztaccihuatl,—regarded in the simple fancies of the Mexican Indians as man and wife,—like two giant sentinels guarding the portal of the Mexican valley. Reaching the summit of the burning mountain, De Ordaz stood at an elevation upwards of two thousand feet higher than the lofty monarch of Europe's Alpine chain. Marked as Popocatepetl then was by the characteristics of an active volcano, it was regarded with superstitious terror by the natives as the dread abode of departed spirits, the ghosts of death-deposed tyrants, whose fiery agonies reproduced there the convulsions of the classic Titans. From this awful height, De Ordaz was the first European who beheld the valley of Mexico

with its curious chain of lakes, and in its midst the far-famed capital of Montezuma, with its white towers and pyramidal teocalli rising from their walled enclosures, reflecting back the sun from their stuccoed walls, till, as Bernal Diaz reports on another occasion: "The buildings of Cempoal having been lately whitewashed and plastered, one of our horsemen was so struck with the splendour of their appearance in the sun, that he came back in full speed to Cortes to tell him that the walls of the houses were of silver."

The men of that generation which witnessed the discoveries of mighty empires, and an El Dorado beyond the known limits of the world, had their imaginations expanded to the reception of any conceivable wonders. Sir Thomas More constructed his *Utopia* out of one of those supposed traveller's tales; and Othello styles his wonderful relations a "traveller's history:"

> "Wherein of antres vast and desarts idle,
> Rough quarries, rocks, and hills whose heads touch heaven,
> It was my hint to speak."

The fine poetical imagination of Columbus was one of the sources of his peculiar power, whereby he anticipated with an undoubting faith the realization of his grand life-work. But from the position in which Cortes was placed, it was his interest rather to give currency to the highly-coloured visions of his first pioneers, than to transmit to Europe the colder narrative of more matured experience. Approaching the Mexican capital, he exclaims in his first burst of enthusiasm: "We could compare it to nothing but the enchanted scenes we had read of in *Amadis de Gaul*, from the great towers and temples, and other edifices of lime and stone which seemed to rise up out of the water." To achieve the recognised mastery of this scene of enchantment, he had not only to conquer its Mexican lords, but to defeat his Spanish foes, and to win

to his side that Emperor who, while giving shape to Europe's history in one of its mightiest revolutions, could control the destinies of the New World. When reading his accounts of the gorgeous treasures of Montezuma's palaces which he transmitted to the Emperor, we have to bear in remembrance that the treasures themselves perished in the dread retreat of the *noche triste*, as the city itself vanished in the final siege and capture. The very dreams of an excited imagination could become realities of the past to the narrators themselves, when every test of their truth had been swept away.

On the 9th of November 1519, Cortes made his first entry into the capital of Montezuma, and from thence he wrote to the Emperor Charles v., giving an account of the Indian metropolis, with the palaces of its nobles and the stately mansions of its wealthy citizens, far surpassing in grandeur and beauty the ancient Moorish capital of Cordova. The palaces of Montezuma he described as so wonderful that it was hardly possible to exaggerate their beauty and extent. Conduits of solid masonry supplied the city with water, and furnished means of maintaining hanging-gardens luxurious as those of ancient Babylon. "There is one place," says Cortes, "somewhat inferior to the rest, attached to which is a beautiful garden with balconies extending over it, supported by marble columns, and having a floor formed of jasper elegantly inlaid;" and he adds, "Within the city, the palaces of the cacique Montezuma are so wonderful that it is hardly possible to describe their beauty and extent. I can only say that in Spain there is nothing equal to them." The population of ancient Mexico, "the greatest and noblest city of the whole New World," as Cortes styles it, amounted, according to the lowest computation of its conquerors, to three hundred thousand; and its streets and canals were illuminated at night by

the blaze from the sacred altars of numberless teocallis that reared their pyramidal summits in the streets and squares of what Prescott fitly calls "this city of enchantment." Vast causeways, defended by drawbridges, and wide enough for ten or twelve horsemen to ride abreast, attracted the admiring wonder of the Spaniards, by the mechanical skill and geometrical precision with which they were constructed of huge masses of stone laid in cement. "The great street facing the southern causeway was wide, and extended some miles in nearly a straight line through the centre of the city. A spectator standing at one end of it, as his eye ranged along the deep vista of temples, terraces, and gardens, might clearly discern the other, with the blue mountains in the distance, which, in the transparent atmosphere of the table-land, seemed almost in contact with the buildings."[1] Near the centre of the city rose a huge pyramidal pile, dedicated to the war-god of the Aztecs, the tutelary deity of the city; second in size only to the great pyramid-temple of Cholula, and occupying the area on which now stands the Cathedral of modern Mexico. Beyond the Lake of Tezcuco stood the rival capital of that name, resplendent with a corresponding grandeur and magnificence; and the whole Mexican valley burst on the eyes of the conquerors as a beautiful vision, glittering with towns and villages, with rich gardens, and broad lakes crowded with the canoes of a thriving and busy populace.

Less than three centuries and a half have intervened since Cortes entered the gorgeous capital of Montezuma; and what remains now of its ancient splendour, of the wonders of its palaces, the massive grandeur of its temples, or the cyclopæan solidity of its conduits and causeways? Literally, not a vestige. The city of Con-

[1] Prescott's *Conquest of Mexico*, B. III. ch. ix.

stantine has preserved, in spite of all the destructive vicissitudes of siege and overthrow, enduring memorials of the grandeur of the Byzantine capital more than a thousand years ago. Rome, too :

> "The Goth, the Christian, time, war, flood, and fire,
> Have dealt upon the seven-hilled city's pride ;
> She saw her glories, star by star expire,
> And up the steep barbarian monarchs ride,
> When the car climb'd the Capitol ; far and wide
> Temple and tower went down, nor left a site :
> Chaos of ruins !"

Yet Rome has her memorials not only of three or four centuries, but of generations before the Christian era ; and even Jerusalem appears to have some stones of her ancient walls still left one upon another. In spite, therefore, of the narrative of desolating erasure, which describes to us the final siege and capture of Mexico, we must assume its edifices and causeways to have been for the most part greatly more slight and fragile than the description of its conquerors implies, or evidences of such extensive and solid masonry must have survived to our time.

But one trustworthy memorial of native civilisation and mechanical skill has been preserved in the famous Calendar Stone : a huge circular block of dark porphyry, disinterred in 1790 in the great square of Mexico, which discloses evidences of progress in astronomical science altogether wonderful in a people among whom civilisation was in other respects so partially developed, but which finds further confirmation from their paintings. The Mexicans had a solar year of 365 days divided into eighteen months of twenty days each, with the five complementary days added to the last. The discrepancy between the actual time of the sun's annual path through the heavens and their imperfect year, was regulated by the intercalation of thirteen days at the end of every

fifty-second year. According to Gama, who differs from Humboldt on this point, the civil day was divided into sixteen parts; and he conceives the Calendar to have been constructed as a vertical sun-dial. Mexican drawings also indicate that the Aztecs were acquainted with the cause of eclipses. But beyond this, our means of ascertaining the extent of their astronomical knowledge

FIG. 17.—Mask, Mexican Calendar Stone.

fail; while we have proofs that their inquiries were zealously directed to the more favoured speculations of the astrologer, which have supplanted true science in all primitive stages of society. Mr. Stephens has drawn attention to certain points of notable correspondence between the boldly sculptured central device on the Calendar Stone, and a hideous mask, with widely-expanded eyes and tongue hanging out, which forms a

prominent feature in the curious scene of sacrifice or offerings sculptured in relief in the Casa de Piedra at Palenque. But the correspondence amounts to little more than this, that each is a gigantic mask with protruding tongue. That of the Calendar Stone is engraved here from the cast brought home by Mr. Bullock, and now in the Collection of the Society of Antiquaries of Scotland. The statues dug up along with the Calendar Stone from among the remains of the great teocalli of Mexico, were buried in the court of the University, to place them beyond reach of the idolatrous rites which the Indians were inclined to pay to the gods of their ancestors; but at the solicitation of Mr. Bullock they were again disinterred, to admit of his obtaining casts of them; and he furnishes this interesting account of the sensation excited by the restoration to light of the largest and most celebrated of the Mexican deities:—"During the time it was exposed, the court of the University was crowded with people, most of whom expressed the most decided anger and contempt. Not so, however, all the Indians. I attentively marked their countenances. Not a smile escaped them, or even a word. All was silence and attention. In reply to a joke of one of the students, an old Indian remarked, 'It is very true, we have three very good Spanish gods, but we might still have been allowed to keep a few of those of our ancestors!' And I was informed that chaplets of flowers had been placed on the figure by natives who had stolen thither unseen in the evening."[1]

The figure which thus reawakened patriotic sympathies in the degenerate descendants of the subjects of Montezuma, is a rude disproportioned idol, strikingly contrasting with the elaborate hieroglyphical devices and well-proportioned figures and decorations which accom-

[1] Bullock's *Six Months in Mexico*, p. 111.

pany the grotesque mask in the Casa de Piedra of Palenque. In the latter, the principal human figures present the remarkable profiles of the ancient Central American race, with the prominent nose, the retreating forehead and chin, and the protruding under-lip, so essentially different from the features either of the Mexicans or northern Indians. The subject race on whom they tread are characterized by a diverse profile, with overhanging brows, a Roman nose, and a well-defined chin; while their costume is equally indicative of a different origin.

But rude as is the sculpture of the Mexican Calendar Stone, it embodies evidence of an amount of knowledge and skill not less interesting for us than the mysterious hieroglyphics of the Palenque tablets; and was believed by Humboldt to indicate unmistakable relations to the ancient native science of south-eastern Asia. Mr. Stephens has printed a curious exposition of the chronology of Yucatan, derived from native sources by Don Juan Pio Perez. From the correspondence of their mode of computing time with that adopted by the Mexicans, he assumes that it probably originated with them; but at the same time he remarks that the inhabitants of Mayapan, as the Peninsula was called at the period of Spanish invasion, divided time by calculating it almost in the same manner as their ancestors the Toltecs, differing only in the particular arrangement of their great cycles. Their year commenced on the 16th of July, an error of only forty-eight hours in advance of the precise day in which the sun returns there to the zenith, on his way to the south, and sufficiently near for astronomers who had to make their observations with the naked eye. Their calendar thus presents evidences of native and local origin. According to Humboldt, the Mexican year began in the corresponding winter half of the year,

ranging from the 9th to the 28th of January, but Clavigero places its commencement from the 14th to the 26th of February. If my ideas as to evidence of a marked inferiority in the terra-cottas and sculptures of the Mexicans, and the very questionable and vague nature of the proofs of their architectural achievements are correct, they tend to confirm the inference, that not to the Aztecs, but to their peaceful and more civilized Toltec predecessors, must be ascribed that remarkable astronomical knowledge and accuracy in the arrangement of their calendar, which exhibits a precision in the adjustment of civil to solar time, such as only a few of the more civilized nations of the Old World had attained to at that date. So far, therefore, as a native and indigenous American civilisation is concerned, it matters little whether it be ascribed to Toltec or Aztec origin. Of its existence no doubt can be entertained, and there is little more room for questioning, that among races who had carried civilisation so far, there existed the capacity for its full development, independently of all borrowed aid from the science or the philosophy which Greece called into being, and modern Europe had matured. The fierce Dane and the haughty Norman seemed to offer equally little promise of intellectual progress in their first encroachments on the insular Saxon, but out of such combined elements have sprung the modern race, which has outstripped the Spaniard in making of the land of Columbus a New World; and, left to its own natural progress, the valley of Anahuac, with its mingling races, might have proved the fountain from whence intellectual life should flow to the nations of the West. But the modern Mexico has displaced the ancient capital of Montezuma; cathedral, convents, and churches, have usurped the sites of the Aztec teocallis; its canals have disappeared, and its famous causeways are no

longer laved by the waters of the Tezcucan Lake. It is even denied by those who have personally surveyed the site, that the waters of the lake can ever have overflowed the marshes around the modern capital, or stood at a much nearer point to it than they do at present.[1] Fresh doubts seem to accumulate around its mythic story. The ruined masonry of its vanished palaces and temples may be assumed to have been all swallowed up in the edifices, which combine to make of the modern capital so noble and striking an object, amid the strange scenery of its remarkable elevated tropical valley. But Mexico was not the only city, nor even the only great capital, of the valley.

In attempting to trace back the history of the remarkable population found in occupation of the Mexican territory when first invaded by the Spaniards, we learn, by means of various sources of information already referred to, but chiefly on the dubious authority of Ixtlilxochitl's professed interpretations of picture-writings, no longer in existence; and of traditions of old men of other generations, concerning events reaching back from seven or eight, even to twelve centuries before their own time: that the Toltecs, advancing from some unknown region of the north, entered the territory of Anahuac, "probably before the close of the seventh century." They were, according to their christianized half-blood historian, already skilled in agriculture and the mechanical arts, familiar with metallurgy, and endowed with all the knowledge and experience out of which grew the native civilisation of Anahuac in later ages. In the time of the Conquest, extensive ruins are said to have still indicated the site of their ancient capital of Tula, to the north of the Mexican valley. The tradition of such ruined cities

[1] Topographical View of the Valley, Wilson's *New History of Mexico*, p. 452.

adds confirmation to the inferences derived from those more recently explored in regions to the south; and still the name of Toltec in New Spain is synonymous with *architect:* the mythic designation of a shadowy race, such as glances fitfully across the first traditional chapters of legendary history among the most ancient nations of Europe. But subsequent to those Pelasgi of the New World, there followed from the unknown regions of the far north the Chichimecas, the Tepanecs, the Acolhuans or Tezcucans, the Aztecs or Mexicans, and other inferior tribes; so that, as we approach a more definite period of history, we learn of a league between the States of Mexico and Tezcuco, and the kingdom of Tlacopan, under which Tenochtitlan or Mexico, the Aztec capital, grew into the marvellous city of temples and palaces described by Cortes and his followers. But Ixtlilxochitl, or Don Fernando de Alva, claimed descent on his mother's side from the Imperial race of Tezcuco, the Athens, as Prescott styles it, of the western world; and he has not failed to preserve, or to create the memorials of the glory of that imperial city of the laguna. It contained upwards of four hundred stately edifices for the nobles. The magnificent palace of the Tezcucan emperor "extended, from east to west, twelve hundred and thirty-four yards, and from north to south, nine hundred and seventy-eight. It was encompassed by a wall of unburnt bricks and cement, six feet wide and nine high, for one half of the circumference, and fifteen feet high for the other half. Within this enclosure were two courts. The outer one was used as the great market-place of the city, and continued to be so until long after the Conquest. The interior court was surrounded by the council-chambers and halls of justice. There were also accommodations there for the foreign ambassadors; and a spacious saloon, with apartments opening into it, for men of science and

poets, who pursued their studies in this retreat, or met together to hold converse under its marble porticos."[1] Such is the style in which the historian of the Conquest describes the glories of ancient Tezcuco, from the records left by Spanish and native chroniclers. A lordly pile, provided for the fitting accommodation of the sovereigns of Mexico and Tlacopan, contained three hundred apartments, including some fifty yards square. Solid materials of stone and marble were liberally employed both on this and on the apartments of the royal harem, the walls of which were incrusted with alabasters and richly tinted stucco, or hung with gorgeous tapestries of variegated feather-work. Some two leagues distant, at Tezcotzinco, was the favourite residence of the sovereign; on a hill, "laid out in terraces, or hanging gardens, having a flight of five hundred and twenty steps, many of them hewn in the natural porphyry. In the garden on the summit was a reservoir of water, fed by an aqueduct carried over hill and valley for several miles on huge buttresses of masonry. A large rock stood in the midst of this basin, sculptured with hieroglyphics representing the years of Nezahualcoyotl's reign, and his principal achievements in each. On a lower level were three other reservoirs, in each of which stood a marble statue of a woman, emblematic of the three estates of the empire. Another tank contained a winged lion,"—but here the historian grows incredulous, and appends a (?) before proceeding in accordance with his historical authorities to add—"cut out of the solid rock, bearing in his mouth the portrait of the emperor." The authority for all this lived and wrote in the beginning of the seventeenth century. His narrative appears to receive some confirmation from architectural remains still visible on the hill of Tezcotzinco, and referred to by Latrobe and Bullock as relics

[1] Prescott's *Conquest of Mexico*, B. I. chap. vi.

of an era greatly more remote than that of Aztec civilisation. But where are now the magnificent remains of the imperial city of Tezcuco? The spirit of Spanish romance and Moorish fable seems to beset modern as well as ancient narrators, as if a spell of enchantment still guarded the legends of Aztec and Tezcucan empire. Bullock, in his *Six Months in Mexico,* describes the remains of the royal fountain of Tezcotzinco, witnessed by him, as a "beautiful basin, twelve feet long by eight wide, having a well five feet by four deep in the centre;" but Latrobe, in his *Rambles in Mexico,* reduces the dimensions of the royal bath to "perhaps two feet and a half in diameter, not large enough for any monarch bigger than Oberon to take a duck in." This agrees with other authorities, and with accounts received by Prescott from persons resident on the spot. It is suggestive, therefore, of grave doubts relative to the first-mentioned traveller's observation of ancient terraces still entire, and numerous remains of the sculptured blocks of the Tezcucan temples and palaces visible in its modern buildings.

Of Tezcuco, a recent traveller tells us that its sole memorial is an insignificant mud village. "There are no remains of ancient aqueduct or hanging garden, nor of its magnificent palaces and surrounding villas, nor of its halls of justice. Even the walls of its vast enclosures have left no trace."[1] Friar Thomas Gage, writing within a century of the Conquest, with no incredulity as to the former greatness and high civilisation of the Mexican Valley, speaks of Tezcuco as but a poor village of some three hundred Indians, and one hundred Spaniards, whose subsistence mainly depended on the herbs they took daily in their canoes to the Mexican market; while in passing another famed or fabled scene of ancient native grandeur,

[1] Wilson's *New History of the Conquest of Mexico.* p. 57.

he remarks: "We passed the Mexicalzingo, which formerly was a great town, but has now not above one hundred inhabitants."[1] But the extravagant character of the whole romance of the Spanish conquistadors seems to be summed up in the criticism of the former writer, based on topographical evidence as noted by himself. He shows, that owing to the relative levels, Mexico never can have been surrounded by the lake, which now lies distant from its marshy site; while the multitudes, crowding the great cities of the Valley at the era of the Conquest, vanish like the porphyry of their temples, and the marbles of their palaces, when we read of "three imperial capitals, and three crowned heads of the empire, within a space of sixteen miles, in a mountain valley twenty miles in extent, and more than half that space filled with salt marsh."[2]

Of the great Mexican pyramid or teocalli of Huitzilopotchli, no vestige now remains, unless such as is reputed to lie buried under the foundations of the cathedral which occupies its site. But time and fate have dealt more tenderly with the scarcely less famous pyramid of Cholula. The ancient city of that name was said to include, within and without its walls, when first seen by Cortes, about forty thousand houses, or according to ordinary rules of computation, two hundred thousand inhabitants. But whatever its ancient population may have been, time and the fruits of Spanish conquest have advanced it to the rank of the capital of the republic of Cholula, though they have left only sixteen thousand as the number of the modern occupants. Still, Cholula was unquestionably one of the most ancient and famous of the cities of the New World: the sacred Mecca for the pilgrims of Anahuac.

[1] Gage's *New Survey of the Indians*, p. 90.

[2] Wilson's *New History of Mexico*, p. 48.

Quetzalcoatl, the milder god of the Aztec pantheon, whose original worship was performed by offerings of fruits and flowers in their season, was venerated as the divine teacher of the arts of peace. His reign on earth was the golden age of Anahuac, when its people learned from him agriculture, metallurgy, and the art of government. But their divine benefactor, according to the sacred tradition handed down to the Aztecs by an elder people whom they had superseded, incurred the wrath of another of the gods; and as he passed on his way to abandon the land to the rule of the terrible Huitzilopotchli, he paused at the city of Cholula, and while he tarried there, the great teocalli was reared and dedicated to his worship. But the benevolent deity could not remain within reach of the avenger. According to the universally received tradition of the plateau, after spending twenty years among them, teaching to the people the arts of civilisation, he passed onward till he reached the shores of the great ocean, and there embarking in a vessel, made of serpents' skins, his followers watched his retreating bark on its way to the sacred isle of Tlapallan. But the tradition lived on among the Mexicans that the bark of the good deity would revisit their shores; and this fondly cherished belief materially contributed to the success of the Spaniards, when their huge-winged ships bore the beings of another world to the mainland of the Mexican Gulf. The legend bears all the marks of anciently derived hero-worship, in which the love for a lost benefactor wove for itself a benevolent deified embodiment of his virtues. This, however, is important to note, that the Aztec traditions told that the pyramid of Cholula belonged to an older race and era than their own. It was there when they entered the plateau, and the arts of the divine metallurgist were taught, not to them but to the Toltecs, whom they superseded. Nevertheless, the

deity shared in their worship; his image still occupied the shrine on the summit of the pyramid of Cholula, resplendent with gold and jewels, when the Spaniards first visited the holy city of Anahuac; and the undying flame flung its bright radiance far into the night, to keep alive the memory of the good deity, who was one day to return and restore the golden age.

The present appearance of the great teocalli very partially justifies the reference made by Prescott to it as "that tremendous mound on which the traveller still gazes with admiration as the most colossal fabric in New Spain, rivalling in dimensions, and somewhat resembling in form, the pyramidal structures of ancient Egypt." If it ever was a terraced pyramid, time and the elements have wholly effaced the traces of its original outline. On the high authority of Humboldt, it is described as a pyramidal mound of stone and earth, deeply incrusted with alternate strata of brick and clay, which "had the form of the Mexican teocallis, that of a truncated pyramid facing with its four sides the cardinal points, and divided by the same number of terraces." But the *adobe* of the Mexican, which is frequently styled brick, is nothing more than a mass of unbaked clay, or even mud. If such, therefore, is the supposed brick which alternated with the other materials of the mound, we can the more readily reconcile the seeming contradictions of observers. One of the latest thus describes the impression produced on his mind: "Right before me, as I rode along, was a mass of trees, of evergreen foliage, presenting indistinctly the outline of a pyramid, which ran up to the height of about two hundred feet, and was crowned by an old stone church, and surmounted by a tall steeple. It was the most attractive object in the plain; it had such a look of uncultivated nature in the midst of grain fields. It would have lost half its attractiveness had it been the

stiff and clumsy thing which the picture represents it to be. I had admired it in pictures from my childhood, for what it was not; but I now admired it for what it really was: the finest Indian mound on this continent."[1] Such is the conclusion arrived at by Mr. Robert Anderson Wilson, as the result of personal observation; and the deductions ultimately suggested to him from further investigation, have since been embodied in his *New History of the Conquest of Mexico*. He there comments on the observations of Humboldt, and compares them with his own, and with the disclosures made subsequently to the great traveller's visit. Recent excavations had exposed abundant traces of Indian sepulture, with the familiar and rude relics of their primitive arts; and these suggest to him the remark:—"Humboldt says that the pyramid of Cholula is composed of alternate strata of brick and clay; another, more exact, says, where the road was cut through its base, that it presents the appearance of alternate layers of earth, two inches in thickness, with layers of brick one inch. To the author, looking at it superficially, it had the appearance simply of different soils. But time has been busy on this mass of earth since Humboldt was there. The cypresses he mentions are gone, and a large part of the churchyard wall has also fallen." Accordingly the mound, which is engraved in Humboldt's *Vues de Cordillères* as a series of four successive terraces, rising to an elevation of less than a sixth of the length of its base line, is figured by Mr. R. A. Wilson from sketches taken on the spot, as a lofty conical mound, of greater elevation than breadth of base, overgrown with shrubs, and without any trace of terraces.[2] Each is surmounted with a church, but there is no other recognisable feature of resemblance between

[1] *Mexico and its Religion*, by R. A. Wilson.

[2] *New History of Mexico*, p. 381.

the two. Both time and human hands have been busy on the ancient pile; and doubtless in earlier years and centuries both have wrought many changes on its original surface. The church on the summit of the mound is now the only appearance of art about it, and no doubt has somewhat to do with its absence elsewhere; for if the clergy found the teocalli cased, like the pyramidal terraces of Central America, with cut stone steps and facings, there can be little doubt they would go no further for a quarry for their intended church.

But after making every allowance for the influence of time's effacing and defacing touch, it is difficult to believe that the sacred city of Cholula ever realized the magnificent picturings of its Spanish conquerors, with its hundreds of mosques and towers, its lofty white temples, and its picturesque exterior, more beautiful than any city of Spain. Of the solidly built houses, the numerous and large pyramidal temples, and all the substantial magnificence which is said to have struck the Spaniards with such wonder, not a vestige remains. The only traces of ruins are those of several deserted convents; and the town is described as a mere collection of *adobe* or mud huts. But the mutilated earthen pyramid still exists, and on its truncated summit is the temple of the newer faith, the construction of the approach to which must have still further contributed to efface the original features of the mound. "By going round to the north side," says Mr. R. A. Wilson, "I obtained a fine view of the modern improvements constructed upon this Indian pile. I rode up a paved carriage-way into the churchyard that now occupies the top, and giving my horse to a squalid Indian imp, who came out of the vestry, I went in and took a survey of the tawdry images, through which God is now worshipped by the baptized descendants of the builders of this pyramid." It was upon this

occasion that "the discovery of a common flint arrow-head—an indispensable part of the usual weapons of a North American Indian,—upon the pyramidical mound of Cholula, first aroused suspicion, and set the author upon the inquiry into the pretended civilisation of Montezuma and his Aztecs."[1] The reasoning, however, is equally fallacious which assumes either from the flint arrow-head on the surface, or the Indian graves with corresponding relics disclosed by superficial excavations, that therefore the Cholula pyramid is a mere Indian mound. The great mounds of Ohio, and the singular earthworks of Wisconsin, in like manner disclose superficial interments of a comparatively recent date, and of a totally distinct character from the genuine sepulchral depositories of the ancient Mound-Builders. But it may not perhaps be without some significance to note another correspondence suggested by "the alternate layers of different coloured soils" exposed in the cutting made in the pyramid, and the striking peculiarity of a like kind which universally characterizes the excavated sacrificial mounds of the Mississippi Valley. The determination of the extent of resemblance between the two must be reserved for future exploration. Theory and superficial observation are of little avail. On the same lofty platform, where Cortes converted the half-burned temple of the great teocalli to the purposes of a Christian church, now stands a more modern ecclesiastical structure, dedicated to Our Lady *de los Remedios*, whose shrine is tended by an Indian priest of the blood of the ancient Cholulans; and still more, the same magnificent landscape greets the eye, as was first gazed on by the conqueror from that elevated summit.

To the north of the Mexican valley ancient ruins arrest the gaze of the traveller, onward even to Cali-

[1] *New History of the Conquest of Mexico*, p. 78.

fornia. On the Rio Colorado and its tributaries, numerous ruins of great extent have been surveyed by recent exploring parties, and are described as built with large stones, nicely wrought, and accurately squared. But nothing in their style of architecture suggests a common origin with the ruins of Mexico or Central America. They are large and plain structures, with massive walls, evidently constructed for defence, and with no traces of the ornamentation which abounds on the ruins of Yucatan. The Moqui Indians, the supposed remnant of the ancient builders, still construct their dwellings of stone with a great deal of art and skill. They are a gentle and intelligent race, small of stature, with fine black hair; and differ essentially from the Indians of the North-west. Their villages are included in one common stone structure, generally of a quadrangular form, with solid, unpierced walls externally, and accessible only by means of a ladder. These hive-like colonies are usually placed, for further defence, on the summit of the lofty plateaus, which in the region of New Mexico are detached by the broad cañons with which that remarkable region is intersected. By such means the remnant of this ingenious people seek protection from the wild Indian tribes with which they are surrounded. Thus permanently settled, while exposed to the assaults of marauding nomades, the Moquis cultivate the soil, raise corn, beans, cotton, and more recently some vegetables derived from intercourse with the Mexicans. They have also their flocks of sheep and goats; and weave their dyed wools into a great variety of substantial and handsome dresses. But of this interesting people only a small remnant now survives, occupying seven villages on the range of the Rio del Norte.[1] Throughout New

[1] Dr. Latham speaks of the Moqui as a people that "no living writer seems to have seen."—*Varieties of Man*, p. 394. But the above information

California ruined structures of stone, and sometimes of clay abound. The *Casas grandes*, as they are called, appear to have been defensive structures like the Moqui villages. Captain Johnston describes one, called the Casa de Montezuma, on the river Gila, which measured fifty feet by forty, and had been four storeys high. It is indeed worthy of note that while we find throughout the continent, from the Rocky Mountains to the Atlantic, scarcely a vestige of ante-Columbian stone architecture: traces of it increase upon us with every new exploration of the country that lies between the Rocky Mountains and the Pacific, and merges towards the south into the seats of ancient native civilisation and matured architectural skill.

But the Southern Continent of America had also its seat of a remarkable native civilisation, deriving, like that of Mexico, some of its most striking characteristics from the physical aspects of the country in which it originated, and from the peculiar natural advantages resulting from the settlement of a people on the lofty plateaus of the Andes, but within the tropics, where at each successive elevation a different climate was secured. Such products as the mercantile navies of Northern Europe gather from many distant shores, were there brought within the compass of the industrious population, who fed their flocks on the cold crests of the sierra, cultivated their gardens and orchards on its higher plateaus, and gathered the luxuriant products of the tropics from the country that for them lay, for the most part, beneath the clouds, and spread away from the lowest slopes of the Andes to the neighbouring shores

communicated to me by Professor Newberry, is the result of his own personal observations. He showed me also specimens of their woven dresses, manifesting considerable skill, and exhibiting great taste in the arrangement of their bright colours. They have recently been greatly reduced by small-pox.

of the Pacific. The character of the people, and the nature of the civilisation of this remarkable country presented many striking contrasts to the customs and institutions of the Mexicans, and these have generally been assumed as of totally independent origin.

Peru has her historic traditions, no less than Mexico, and her native historian, Garcilasso de la Vega, a descendant, through his mother, from the royal line of the Incas; who plays for them the part which Fernando de Alva did for his Tezcucan ancestry. Seen through such a medium, the traditions of the Inca race expand into gorgeous scenes of romance; and the institutions of European chivalry and mediæval polity are grafted on the strange usages of an Indian nation, remarkable for its own well-matured commonwealth, and unique phases of native-born civilisation. Sabaism constituted the essential element of Peruvian religious faith, and gave form and colour to the national rites and traditions. Manco Capac and Mama Oello Huaco, their mythic instructors in the arts of agriculture, weaving, and spinning, were the Children of the Sun; their high religious festivals were determined by the solstices and equinoxes, which marked the great stages of its annual progress; and Quito, the sacred city, which lay immediately under the Equator, had within it the sacred pillar of the sun, where his vertical rays threw no shadow at noon, and they believed the god of light to seat himself in full effulgence in his temple. The sacred pillar stood in the centre of a circle described within the court of the great temple, traversed by a diameter drawn from east to west, by means of which the period of the equinoxes was determined; and both then, and at the solstices, the pillar was hung with garlands, and offerings of fruit and flowers were made to the divine luminary and parent of mankind. The title of the sovereign Inca was the Child of

the Sun; and the territory of the empire was divided into three portions, of which one, constituting the lands of the Sun, maintained the costly ceremonial of public worship, with the temples and their numerous priests and vestal virgins. The national traditions pointed to the Valley of Cuzco as the original seat of native civilisation. There their mythic Manco Capac founded the city of that name; and on the high lands around it a number of columns were reared which served for taking azimuths, and by measuring their shadows the precise time of the solstices were determined.

Besides the divine honours paid to the sun, the Peruvians worshipped the host of heaven, and dedicated temples to the thunder and lightning, and to the rainbow, the wrathful and benign messengers of the supreme solar deity. It might naturally be anticipated that a nation thus specially devoted to astronomical observations, and maintaining a sacred caste exclusively for watching solar and stellar phenomena, would have attained to great knowledge in that branch of science. Apparently, however, the facilities which their equatorial position afforded for determining the few indispensable periods in their calendar, removed the stimulus to further progress; and not only do we find them surpassed in this respect by the Muyscas, occupying a part of the same great southern plateau, who regulated their calendar on a system presenting considerable points of resemblance to that of the Aztecs; but they remained to the last in total ignorance of the true causes of eclipses, and regarded such phenomena with the same superstitious and apprehensive wonder as has affected the untutored savage mind in all ages. One historian, indeed, affirms that they recognised the actual length of the solar year, and regulated their chronology by a series of cycles of decades of years, centuries, and decades of centuries, the last of

which constituted the grand cycle or great year of the sun.[1] This is only confuted by a reference to the silence of earlier authorities, and the absence of their evidence on the subject; and may serve to remind us how very imperfect is all the knowledge we possess of the intellectual development of this singularly interesting people, among whom science was essentially esoteric, and systematically excluded from the vulgar. It is a presumptuous assumption, that whatever we cannot now recover the proofs of, never existed. Prescott, indeed, suggests that the very imperfect nature of the astronomical science of Peru may be explained, in part at least, by the fact, that the Peruvian priesthood were drawn exclusively from the body of the Incas: a privileged order of nobility who claimed divine origin, and were the less tempted thereby to seek in the adventitious attributes of superior learning the exclusive rights of an intellectual aristocracy. Such, however, very imperfectly accounts for the inferiority of those "children of the sun," and worshippers of the stars, in the knowledge and practical application of astronomy. Other reasons may at least help us to explain this singular intellectual condition of a nation, which had in so many other directions made remarkable progress in civilisation. The very fact that astronomy constituted, as it were, the national religion, placed it beyond the reach of scientific speculation, among a people with whom blasphemy against the sun, and malediction of the Inca, were alike punished with death. The impediments to Galileo's astronomical discoveries were trifling indeed when compared with those which must have beset the presumptuous Inca priest who ventured to deny the diurnal revolution of the sun round the earth; or to explain, by the simple interposition of the moon between themselves and the sun, the mysterious

[1] Montesino's *Mem. Antiquas MS.*, lib. ii. cap. 7; cited by Prescott.

and malign infirmities with which it constituted a part of the national creed to believe their supreme deity was afflicted during the progress of a solar eclipse. But another cause also tended to retard the progress of the Peruvians in the intelligent solution of astronomical phenomena. Among the ancient Egyptians we find the division of the year determined by the changes of the Nile; and their vague year of 365 days abandoned for a civil year regulated by applications of astronomical science, minutely interwoven with all their sacred as well as civil institutions. But the phenomena of the seasons, which have fostered with every other civilized nation the accurate observation of the astronomical divisions of time, and the determination of the recurring festivals dependent on seed-time and harvest: were almost inoperative, where, among a people specially devoted to agriculture, each season and every temperature could be commanded by a mere change of elevation under the vertical sun of the Equator.

The Peruvians, however, must be tried by their own standards of excellence. Manco Capac, their mythic civilizer, was no war-god, like the Mexitli of the ferocious Aztecs. Agriculture was the special art of civilisation introduced by him; and husbandry was pursued among them on principles which modern science has only recently fully developed in Europe. There alone, in all the New World, the plough was in use; and the Inca himself, on one of the great annual festivals, consecrated the labours of the husbandman by turning up the earth with a golden ploughshare. Artificial irrigation was carried out on a gigantic scale by means of aqueducts and tunnels of great extent, the ruins of which still attest the engineering skill of their constructors. The virtues of *guano,* which are now so well appreciated by the agriculturists of Europe, were familiar to the

Peruvian farmer; and as the country of the Incas included, at its various levels, nearly all varieties of climate and production, from the cocoa and palm that fringed the borders of the Pacific, to the pasture of their mountain flocks on the verge of the high regions of perpetual snow: a systematic succession of public fairs, regulated, like all else, by the supreme government, afforded abundant opportunities for the interchange of their diverse commodities.

Such a country, if any, could dispense with commerce, and attain to considerable advancement without any representative currency or circulating medium. Gold, which was so abundant, served only for barbaric pomp and decoration. Silver was accessible in such quantities, that Pizarro found in it a substitute for iron to shoe the horses of his cavalry. Copper and tin in like manner abounded in the mountains; and the Peruvians had learned to alloy the copper both with tin and silver, for greater utility in its application to the useful arts. The discovery of well-adjusted silver balances in some of the tombs of the Incas, shows that they made use of weights in determining the value of their commodities; and thus were in possession of a systematic mode of exchange, which, for their purposes, was superior to that of the recognised currency of the Mexicans, in the absence of any such means of ascertaining the exact apportionment of commodities produced for sale or exchange.

The progress of the Peruvians in agriculture was accompanied by a corresponding development of the resources of a pastoral people. Vast flocks of sheep ranged the mountain pastures of the Andes, under the guidance of native shepherds; while the Peruvians alone, of all the races of the New World, had attained to that important stage in civilisation which precedes

the employment of machinery, by the use of the lower animals in economizing human labour. The native llama, employed as a beast of burden, carried its light load along the steep paths of the rocky Cordilleras, or on the great highways of Peru. As the mythic Manco Capac was the instructor of the nation in agriculture, so the divine daughter of the Sun introduced the arts of weaving and spinning. Such traditions indicate the favourite directions of the national taste and skill, which were specially displayed in the manufacture of a great variety of woollen articles of the utmost delicacy of texture.

Numerous examples of the woven textures of the Peruvians have been recovered from their ancient graves at Atacama and elsewhere, though it cannot be assumed that in these we have specimens of the rare and costly fabrics which excited the wondering admiration of the early Spaniards. In the arid soil and tropical climate of the great desert of Atacama, articles which prove the most perishable in our northern latitudes are found, after the lapse of centuries, in perfect preservation. Of these I had an opportunity of examining a collection recovered by Mr. J. H. Blake from their ancient huacas, and now preserved in his cabinet at Boston. They include specimens of woven cloth, wrought in dyed woollen thread, into ingenious and tasteful patterns, and sewed in regular and ornamental designs. Each piece is woven of the exact size which was required for the purpose in view, and some of them furnish proofs of ingenious skill in the art of weaving. The threads consist of two or more strands of dyed llama wool twisted together; and elaborate patterns are woven of them into a soft and delicate web. The accompanying figure, though grotesque, is nevertheless a good specimen of a complicated feat achieved in dyed woollen threads on the ancient

Peruvian loom. It was found, along with many other relics, in a Peruvian grave, described minutely in a subsequent chapter. Mr. Blake remarks, in reference to the discoveries of this class which rewarded his researches in Peru:—"In forming an opinion of the degree of skill displayed in the arts of spinning and weaving, by these specimens, it should be borne in mind that the implements in use were of the simplest contrivance. The only ones which have been discovered are simple distaffs, and among the articles obtained from the Atacama graves were several formed of wood and stone, such as are still in use among the Indians of Peru at the present day. Weaving on the loom has not been introduced among them. The warp is secured by stakes driven into the ground, and the filling in is inserted by the slow process of passing it by hand over and under each thread alternately." It would be a grave error, however, to assume that we possess in such relics, recovered from the ordinary graves formed in the loose sand of the desert, the highest achievements of ancient Peruvian skill. On the contrary, regarding them, as we must, as fair specimens of the common woollen tissues of the country, they amply confirm the probability that the costly hangings, and beautifully wrought robes of the Inca and his nobles, fully justified the admiration with which they are referred to by the Spanish writers of the sixteenth century. We read of marvellous specimens of ceramic art made by the ancient Peruvian, surpassing anything found in the common cemeteries of the race; but abundant proofs exist of

FIG. 18.—Peruvian Web.

the ingenuity of the ancient potter expended on the utensils in daily use by the people at large, to render probable the accounts of such rare *chef d'œuvres* wrought by their cunningest workmen for the imperial service. So also we read of the native animals and plants ingeniously executed, with wonderful delicacy, in gold and silver; and scattered with profuse and wanton magnificence about the apartments of the Peruvian princes and nobles. Such specimens of goldsmiths' work no longer survive; but still the huacas of the ancient race are ransacked for golden ornaments, which prove considerable metallurgic skill, and leave no room to doubt that gold and silver were moulded and graven into many ingenious forms. Science and art had indeed made wonderful advances among this remarkable people; though with them, as with the Chinese, they were more frequently expended in the gratification of a craving for display, than in realizing the practical triumphs in which their true value consists. Nevertheless, in all those respects Peruvian civilisation had already wrought out for itself the most essential elements of progress adapted to its native soil. Its astronomical science admits of no comparison with that of Mexico; and in lieu of the artistic picture-writing of the Mexicans, it employed its *quipus*, an artificial system of mnemonics not greatly in advance of the Red Indian wampum, to which it bears so close a resemblance; and strikingly contrasting with the matured hieroglyphical inscriptions, which preserve on the ruined walls of the cities of Central America and Yucatan the evidences of an intellectual progress alike in advance of the highest civilisation of the Aztecs and the Incas, and of all but the most civilized nations of ancient or modern centuries.

But the remarkable system of national polity, when taken into consideration along with the docile, gentle

nature still manifested by the descendants of the Peruvian people, furnishes some key to the peculiar characteristics of their native civilisation. Their government was a sacerdotal sovereignty, with an hereditary aristocracy, and a system of castes more absolute seemingly than that of the Egyptians or Hindus. Something of the partial and unprogressive development of the Chinese mingled in the ancient Peruvians among numerous other traits of resemblance to that singular people. Unlike the Mexicans, we see in their whole polity, arts, and social life, institutions of indigenous growth. It would be difficult to limit the centuries during which such a people may have passed on from generation to generation the slowly brightening torch of their self-developed civilisation. Their own traditions, preserved with the help of quipus and national ballads, are valueless on this point. But their institutions reveal some of the most remarkable evidences of a primitive people, preserving many of the traits of man's social infancy, alongside of such highly matured arts and habits as could only grow up together around the undisturbed graves of many generations. Offerings of fruits and flowers took the place, among that gentle race, of the bloody human sacrifices of Aztec worship; but the suttee rites, which disclose their traces everywhere in the sepulchral usages of primitive nations, were retained in full force. The simple solidity of a pure megalithic art gave an equally primitive character to their architecture, notwithstanding its extensive application to all the most important practical purposes of life; and the precious metals, though existing in unequalled profusion, were retained to the last solely for an unproductive contribution to barbaric splendour. The habits of that pastoral life, by means of which the foremost nations of the Old World appear to have emerged out of primitive barbarism, were with them modified by the

isolated haunts of flocks altogether peculiar to the strange region of mountain and plateau, where also they carried the next step in the scale of human progression, that of agriculture, to a degree of perfection probably never surpassed. They had advanced metallurgy through all its stages, up to that which preceded the use of iron; and, with the help of their metal tools, displayed a remarkable skill in many mechanical arts. They did no more, because under their peculiar local circumstances, and the repressive influences of the mild despotism of Inca rule, they had achieved all that they required. A gentle people found abundant occupation in tilling the varied soil, without being oppressed by a labour which was lightened by the frequently recurring festivals of a joyous, and, in some respects, elevating national faith; nor is it difficult to conceive of such a people continuing to pursue the same even tenor of their way, with scarcely perceptible progression, through all the subsequent centuries since their discovery to Europe, had not the hand of the conqueror ruthlessly overthrown the structure reared by countless generations, and quenched the lamp of native civilisation which lighted them on their way. The conquerors of the sixteenth century have given expression to the astonishment with which they beheld everywhere the evidences of order, contentment, plenty, and prosperity; and while the architectural magnificence of Montezuma's capital has so utterly disappeared as to suggest the doubt if it ever existed: the traveller along the ancient routes of Peruvian industry still meets on every hand the ruins, not only of temples, palaces, and strongholds, but of terraced declivities, military roads, causeways, aqueducts, and other public works, that astonish him by the solidity of their construction and the grandeur of their design.

Reflecting on the striking contrasts which are apparent

between the two great nations thus found at the highest stage of progress in Northern and Southern America, Prescott has remarked: "The Mexicans and Peruvians, so different in the character of their peculiar civilisation, were, it seems probable, ignorant of each other's existence; and it may appear singular that, during the simultaneous continuance of their empires, some of the seeds of science and of art, which pass so imperceptibly from one people to another, should not have found their way across the interval which separated the two nations. They furnish an interesting example of the opposite directions which the human mind may take in its struggle to emerge from darkness into the light of civilisation." Whilst, however, there seems little room for doubt that those two nations were ignorant of each other at the period of the discovery of America: there are traces in some of their arts strongly suggestive of an earlier intercourse between the northern and southern continent, which finds singular confirmation from the correspondence in cranial type, artificial conformation of the head, and other traits suggestive of a common origin, or subjection to some common influences, which reveal themselves in monuments and remains of the region lying to the north of the Isthmus, and repeat themselves from time to time in one or other of their more salient aspects, along the line of geographical transmission between the great mountain range and the shores of the Pacific. Neither the architecture, the astronomical science, the letters, nor the languages of Peru or Central America find a counterpart among any traces of incipient civilisation discernible in the great eastern plain between the Rocky Mountains and the Atlantic; unless we look for them among the buried records of the Mound-Builders. Yet there, amid the tribes familiar to the European in modern times, is the stock from which on many grounds it appears to me

most reasonable to trace the predominant Mexican race of the era of the Conquest: the inheritors, but not the originators of the civilisation of the plateau. Such an idea can only be advanced, in the present state of our knowledge, with a view to further inquiry, and in some of its aspects it is glanced at in other chapters of these volumes; but while the traditions of the Aztecs all pointed to a migration from the north, the Toltecs whom they displaced can be assigned on no tangible evidence to a similar origin. Amid the many diversities of ethnic characteristics recognisable among the tribes and nations of the New World, the forest and prairie tribes, now clustering chiefly in the North-west, are the representatives of one great subdivision, whose origin may be sought in the northern hive which stretches westwards towards Behring Straits and the Aleutian Islands, with their possible suggestion of an Asiatic origin. But for the more intellectual tribes and nations whose ancient monuments lie to the south of the Rio Grande del Norte, not without intermingling some faint traces of their influence along the more northern regions of the Pacific; and perhaps also, even for the strange and mysterious race of the Mound-Builders: the most probable hive of America's civilized and semi-civilized nations appear to me to be sought for in the rich plateaus of the Peruvian Cordilleras, where the country rises through every change of climate under the vertical rays of the Equator; and its rocky steeps are veined with exhaustless treasures of metallic ores, in such a condition as to lead man on step by step from the infantile perception of the native metal as a ductile stone, to the matured intelligence of the skilled metallurgist, mingling and fusing the diverse ores into his most convenient and useful alloys. The theories of migration which the evidence now produced suggests are reserved for the close, and will have to be revised

with every subsequent acquisition of knowledge. It may be that, though time seems to have thrown an impenetrable veil over those centuries which lie behind the era of Columbus's adventurous voyage, yet at least a corner of that veil may be lifted, permitting us to gaze upon the generations over whose ashes we tread, while seeking to interpret the significance of their memorials.

CHAPTER XV.

THE ARTISTIC INSTINCT: IMITATION.

In turning to the consideration of the primitive works of art of the American Continent, whether pertaining to the ancient race of the Mound-Builders, or to modern Indian tribes, the critical observer cannot fail to be struck with the peculiar manifestations of an ingenious imitative skill. Such is by no means confined to the aboriginal artists of the New World; nevertheless it is a very noticeable characteristic of them, in which they present a striking contrast to the primitive artists of Europe. To this remarkable intellectual characteristic of the American Indian, the author's attention was drawn, long before he had opportunities of studying the red man in his native forests. In adopting the term *archaic*, as that which seemed the most suitable definition for the era of primitive British metallurgic art, corresponding to the "Bronze Age" of the north of Europe, in the nomenclature of continental archæologists, it was selected because of its peculiar applicability to the artistic productions of the period. Many of these are exceedingly graceful in form, and some of them highly ornamented, but there is scarcely a trace of imitative design. So also, though the peculiar form of one primitive class of gold ornaments, found in the British Isles, has suggested a name for it derived from the calyx of a flower, which the cups of its rings seem in some

degree to resemble, yet it is a mere fanciful analogy, for no example bears the slightest trace of ornament which would suggest that such similarity was present to the mind of the ancient British goldsmith. Where incised or graven ornaments are wrought upon the flower-like forms, they are the old chevron, or herring-bone, and saltire patterns, which occur on the rudest clay pottery, alike of northern Europe and of America, though executed on the finer gold work with considerable delicacy and taste. The correspondence between the forms and ornamentation of the rudest classes, both of domestic and sepulchral pottery of the Old and New World, appears, at first sight, remarkable; but it is only the inevitable correspondence of the inartistic simplicity inseparable from all infantile art. The ornamentation is almost without exception only an improvement on the accidents of manufacture. The aboriginal British and American potters appear both alike to have produced their first decorations by simply passing twisted cords round the soft clay. More complicated patterns were, in like manner, produced by plaited or knitted cords, though more frequently imitated in ruder fashions with the point of a bone-lance or bodkin. But it is only among the allophylian arts of Europe that such arbitrary patterns are perpetuated with improving taste and skill. The European vase and cinerary urn become more graceful in contour, and more delicate in material and construction, as they accompany the beautiful forms of weapons and personal ornaments wrought in bronze. But in no single case is any attempt made to imitate leaf or flower, bird, beast, or any simple natural object; and when in the bronze work of the later Iron period, imitative forms at length appear, they are chiefly the snake and dragon shapes and patterns, borrowed seemingly by Celtic and Teutonic wanderers, with the

wild fancies of their mythology, from the far Eastern cradle-land of their birth.

This total absence of every trace of imitation in the forms and decorations of primitive British art, and, so far as my observation extends, of the whole archaic art of northern Europe, is curious and noteworthy: for it is by no means an invariable characteristic of the primitive arts of man. In the simplest forms of ancient weapons, implements, and pottery, mere utility was the aim. The rude savage, whether of Europe or America, had neither leisure nor thought to spare for decorative art. His æsthetic faculty had not yet begun to influence his constructive instincts. Ideas of comparison, which enter so largely into the spirit of modern artistic design, and also form so prominent an element in the more artificial compositions of the modern orator and bard, were altogether latent in those elder times. Art was the child of necessity, and borrowed its first adjuncts of adornment from the same sources from whence it had received its convenient but arbitrary forms.

But the moment we get beyond this primitive and mere utilitarian epoch of rudest art, the contrast between the products of early European and American artistic skill is exceedingly striking; and their value to the ethnologist and archæologist becomes great, from the insight they give into the aspects of mental expression, and the intellectual phases of social life, among those unhistoric generations of men. The useful arts of the British allophylian progressed until they superinduced upon themselves the decorative and fine arts. But the ornamentation was inventive, and not imitative; it was arbitrary, conventional, and singularly persistent in style. It wrought itself into all his external expressions of thought, and whatever his religious worship may have been, we look in vain for proofs of his idolatry among

all the innumerable relics which have been recovered from the supposed Druidical fanes, or the older cromlechs and tumuli of the British Isles.[1] The very opposite characteristics meet the eye the moment we turn to the relics which illustrate the primitive arts of the New World. There, indications of imitative design meet us on every hand. Even the rude tribes of the North-west, though living in the simplest condition of nomade savage life, not only copy the familiar animal and vegetable forms with which they are surrounded: but also represent, with curious ingenuity and skill, the novel objects which European enterprise introduces to their notice. Even their plaited and woven grass and quill-work is made to assume a pictorial aspect; and the decorated Indian pottery is not only frequently ornamented with patterns suggestive of their being derived from flowers and other natural objects, but the more elaborated examples are occasionally moulded into the forms of animals. Still more is this the case with the tubes, masks, and personal ornaments, but, above all, with the pipe-heads of the ancient Mound-Builders. Nor does it stop with those smaller productions of art; but, as we have seen, this same remarkable imitative faculty finds expression in the great earthworks both of Wisconsin and Ohio, where the ingenious artist has wrought out his representations of natural objects with the same material with which his enduring pyramids are reared; and on a scale akin to the colossal sphinx, that has looked forth from its stony eyes on the memorial pyramid of old Cheops, while that gnomon of the Nile's desert sundial has traced, with its unresting shadow, the revolutions of thirty centuries of time.

And invaluable are the chronicles of America's ancient history recorded for us by means of this same imitative

[1] Vide *Prehistoric Annals of Scotland*, pp. 339-342.

art. The walls of Central American ruins are covered with voiceless hieroglyphics, and the costly folios of Lord Kingsborough's *Mexican Antiquities* have placed at the command of the scholars of both hemispheres the dubious ideography of native historians; but the records of a long-obliterated past revealed to us by means of the examples of imitative art brought forth from the sealed depositories of the Mound-Builders, disclose chroniclings which all may read; or of the interpretation of which, at least, all are qualified to judge. The picture-writing and the sculptured symbolism are dark to us as were the hieroglyphics of Egypt to a thousand generations, and no new Champollion appears to illumine their mystery; but in these we have America's demotic writings, brief and fragmentary, but intelligible through all their extent. The revelations of the sacrificial mounds have been specially ample and valuable in this respect. These are "the chambers of imagery" of the Western World; wherein are every form of creeping things, and beasts, and all the idols of their ancient worship. But foremost among all the primitive, and nearly all the more recent illustrative relics of native American art, is the tobacco-pipe. It is the peculiar and distinctive symbol of America; as its narcotic usages have been the strange gift diffused by it to nearly every tribe and nation of the Ancient World.

In attempting to determine elements of classification for the diverse types or varieties of man, there are certain minute yet prominent characteristics which, alike among ancient and modern races, supply at least convenient tests of classification; while some of them merit the special consideration of the archæologist and the ethnologist, as indicating far-reaching principles, or derived customs which may furnish the clue to a continuous chain of relations. Of this class is the remarkable and

persistent rite of circumcision, which constitutes a peculiarly distinctive element of isolation with the Jew and his Semitic congeners. Again, the ancient epithet "barbarian" pointed to a distinctive mark of culture and refinement, which this nineteenth century of Christian civilisation seems at length disposed to abandon, alike in the Old World and the New. With the native American Indian, the beardless features have been invariably aimed at: in part because of the scanty natural growth of hair on the face, but also partly because of a universal, immemorial custom; for the sculptured figures of Palenque and Uxmal, the portrait pipe-heads and masks of the Mississippi mounds, the carving of the great Calendar Stone, and the depictions of the Mexican picture-writings, all concur in representing the aboriginal American as beardless. Again, the artificial flattening of the head, a widely diffused, though by no means universal custom among American tribes: also had its existence among ancient nations of the Old World; and is proved by early sculptures to have been practised in those remote times when native American art and architecture appear to have achieved their highest efforts. And not less distinctive than any of those, are the scalp war-trophy and the peace-pipe of the American Indian: the characteristics still, not of a tribe or nation, but of a whole continent. Herodotus refers to scalping as one of the most characteristic war-customs of the Scythians, and to the Scythic practice of hanging the scalp-trophies to the warrior's bridle-rein. Hence the *ἀποσκυθίζειν* of Euripides, quoted by Rawlinson, when remarking the resemblance of such ancient Asiatic customs to those of the Red Indians. The correspondence is worthy of note, in what is otherwise noticeable only as the American counterpart to Egyptian and Oriental accumulations of trophies of the slain—the skulls, the hands, the ears,

or even the foreskins,—repeatedly referred to in the Old Testament Scriptures, and recorded with minute detail in the paintings of Egypt, and the sculptures of Nimroud and Khorsabad. But the pipe is associated with the most solemn rites of the native American; with the lavish sacrifices of the ancient worshipper, laid on the buried altars of his long-deserted mounds; and with the sacred credentials of the ambassador of the tribe, the inspired medicine-man and priest, or the accredited leader, exercising absolute authority for war or peace.

The origin and diffusion of the singular practice of smoking tobacco and other narcotic herbs will come under consideration, in a subsequent chapter, in relation to existing arts and customs of the American aborigines. It is only referred to here, because of the prominent place which the implements of this practice occupy among the works of art of which the sacrificial mounds are the principal depositories. In accordance with the almost universal custom of barbarous and semi-civilized nations, the Mound-Builders devoted to their dead the implements of their favourite or familiar occupations, their pipes and vessels, along with personal ornaments, and objects prized for their worth or valuable for some talismanic charm. Hence the mounds of America disclose to us the same kind of evidence of the past as Wilkinson has deduced from the catacombs of Egypt, or Dennis from the sepulchres of Etruria. But in addition to this, while the altars of Egypt and Etruria have been long overthrown: the remarkable religious rites of the American Mound-Builders have preserved not only their altars, but the offerings laid upon them, before the first seedling fell from whence grew the ancient monarchs of those forests now styled primeval. The perishable garments of the dead have necessarily disappeared; and of instruments or utensils of wood or other combustible

materials it is vain to expect a trace, where even metal has melted and the stone been calcined in the blaze of the sacrificial fires; but articles of copper and stone, of fictile ware, and even of shell, ivory, and bone, have escaped the destructive flame, and withstood the action of time; and it is in those enduring characters that the inscriptions upon the altars of the Mound-Builders are legibly graven. Let us try to read these inscriptions, and translate their records into the language of modern thought.

What they record for us in regard to progress in the mechanical arts and in metallurgy, we have already attempted to decipher. The Mound-Builders were acquainted with several of the metals. Implements and personal ornaments of copper abound in the tombs and on their altars; and the mechanical combination of silver with the native copper of which they are made, while proving their ignorance of the art of smelting metals or reducing them from their ores, tends also very clearly to indicate that they derived their masses of native copper from Lake Superior, where alone the two metals have hitherto been found in the singular mechanico-chemical combination of included crystals of silver in a copper matrix. The accidental, or at least unpremeditated results of their sacrificial fires, have in some cases fused the metallic offerings on the altars into a mass of molten copper; but the Mound-Builder had very imperfectly learned the old arts of Tubal-Cain. He did not smelt the ores, or melt the native copper and cast it into such moulds as his imitative skill, and his ability in modelling the potter's clay, abundantly fitted him to produce. Neither did he attempt the simpler process of welding, much less the valuable art of alloying the metals: although silver is found shaped into personal ornaments, and the sulphuret of lead was

familiarly known to him, and is found in considerable quantities along with his other metallic remains.

Thus far, therefore, those inscriptions tell us that directly, or through some intermediate source, the Mound-Builders shared in the metallurgic wealth of the great copper region of Lake Superior. We are reminded, accordingly, that the broad undulating prairie-lands of Wisconsin, with their remarkable symbolic earthworks, lie directly between the shores of Lake Superior and the great region of the Mound-Builders in Ohio and Illinois. The monuments of the latter abound with deposits of the works of art of their builders, and are surrounded with varied proofs of settled occupation, civic and religious structures, and permanent defensive military works; while within the era of Wisconsin the symbolic mounds stand almost alone, and have hitherto been found to contain no relics of their builders. Neither sacred earthworks adapted to religious rites, nor the military defences of a settled people, attest that the region of Wisconsin was anciently occupied by a numerous population such as its many natural advantages fitted it to sustain. Hence the conjecture that the mineral country on the southern shores of the Great Lake was permanently occupied by no settled tribe, but that its mines were the recognised source of supply for the whole population north of the Gulf of Mexico; and that the different tribes and nations throughout the vast basin of the Mississippi and its tributaries were wont to send their working parties there, as to a common region of the nations. Such an idea well accords with the further conjecture that the numerous symbolic mounds of Wisconsin may be the memorials of sacred rites, or pledges of peace and neutrality among nations from the various tributaries of the great river, as they annually met on this border-land of the common metallic storehouse. It is obvious that the

Mound-Builders were a highly religious people. Their superstitious rites were of frequent occurrence, and accompanied with costly sacrifices; while in the numerous symbolic mounds of Wisconsin, the labour alone is the sacrifice, and the external form preserves the one idea at which their builders aimed.

So far, this theory of a sacred neutral ground and common mineral region is to a great extent conjectural. Nevertheless, it involves certain undoubted facts to be borne in view for comparison with others of a diverse kind. In the once densely-peopled regions of Ohio and Illinois, where the works of the Mound-Builders abound, the river-valleys were occupied by an ingenious, industrious agricultural population, skilful in the execution of a peculiar class of works of art; who, if not aggressive and warlike, employed their constructive skill on extensive works for military defence. Whencesoever the danger existed that they had thus to apprehend and guard against, there is no trace of its locality within the region lying immediately to the south of Lake Superior, through which their path lay to the great copper country. More probably offensive and defensive warfare was carried on between tribes or states of the Mound race settled on different tributaries of the same great water-system. But the growing civilisation of the nations of the Mississippi valley was also exposed to the aggression of barbarian tribes of the North-west; for if the Mound-Builder differed in culture, in blood, and race from the progenitors of the modern Red Indian, the evidences chronicled for us in his sacred muniment chambers seem to place the fact beyond doubt that the Red Indian was not unknown to him.

So far, then, we connect the race of the Mounds with the shores of Lake Superior, and thus trace out for them a relation to regions of the North. But in this we have

no necessary indication of the birth-land or of the course of migration of the Mound race. "It cannot have escaped notice," Messrs. Squier and Davis remark, in drawing their great work on the ancient monuments of the Mississippi Valley to a close, "that the relics found in the mounds—composed of materials peculiar to places separated as widely as the ranges of the Alleghanies on the east, and the sierras of Mexico on the west, the waters of the great lakes on the north, and those of the Gulf of Mexico on the south,—denote the contemporaneous existence of communication between these extremes. For we find, side by side in the same mounds, native copper from Lake Superior, mica from the Alleghanies, shells from the Gulf, and obsidian (perhaps porphyry) from Mexico."[1]

These facts the authors regard as seriously conflicting with the hypothesis of a migration either northward or southward. They at least warn us against any hasty conclusion from partial or one-sided evidence. But meanwhile it appears legitimate to infer from them the proofs of an extensive traffic; and to assume, as at least exceedingly probable, the existence of widely-extended commercial relations as one of the accompaniments of civilisation among that singular race. It must not be inferred, from the use of terms specifically applied to modern trade and commerce, that they are supposed to imply the possession of a currency and exchanges, of banking agencies, or manufacturing corporations. But, without confounding the traces of a rudimentary civilisation with the latest characteristics of its mature development, there are proofs sufficient to justify the inference that the Mound-Builders of Ohio traded with the copper of Lake Superior for objects of necessity and luxury brought from widely-separated regions of the con-

[1] *Ancient Monuments of the Mississippi Valley*, p. 306.

tinent. By many intermediate agencies, rather than by any direct traffic, such exchanges may have been effected. But the river system of the Mississippi has furnished facilities for such interchanges under the far less favourable circumstances of the later forest tribes; and such a systematic trade among an ingenious and settled people may have materially contributed to the progress of civilisation in the populous valleys of Scioto and Ohio.

Turning next to the consideration of facts recorded for us in the sculptures of their sacrificial and sepulchral mounds, we find our study directed to a varied class of objects of singular interest, some of which, at least, fully merit the designation of works of art. Compared, indeed, with the sculptures in porphyry, and the great Calendar Stone of Mexico; the elaborate façades and columned terraces of Uxmal, Zayi, and Kabah; and the colossal statues and basso-relievos of Copan and Palenque, with their mysterious symbols and tablets of hieroglyphics: the art of the Mound-Builders, which found its highest object in the decoration of a tube, or the sculpture of a pipe-bowl, may appear insignificant enough. But the imagination is too apt to be impressed by mere size, and requires to be reminded of the superior excellence of a Greek medal or a Roman gem to all the colossal grandeur of an Egyptian Memnon. The architecture and sculpture of Central America and Yucatan preserve to us the highest intellectual efforts of the New World, and are animated by a historical significance which cannot be over-estimated. Nevertheless, there are examples among the miniature works of art of the Ohio Valley unquestionably admitting of comparison with them in some essential elements of artistic skill. The colossal statues of Copan are marvellous specimens of elaborate barbaric sculpture; but apart from the

significance of the hieroglyphics with which some of them are graven, they are only admissible in a conventional sense among works of art: whereas some of the sculptures taken from the inhumed altars of "Mound City" are examples of imitative art and portrait-sculpture full of character and individuality.

The simplicity, variety, and minute expression in those miniature sculptures, their delicacy of execution and evidence of considerable imitative skill, all render them just objects of interest and careful study. But foremost of all in every trait of value for the elucidation of the history or characteristics of their workers, are the examples of sculptured human heads: some of them presenting striking traces of individual portraiture. Alike from the minute accuracy of many of the sculptures of animals, hereafter referred to, and from the correspondence to well-known features of the modern Red Indian suggested by some of the human heads, these miniature portraits may be assumed, with every probability, to include faithful representations of the predominant physical features of the ancient people by whom they were executed. What would the ethnologist not give for such well-authenticated portraiture of the old Umbrian or Pelasgian, for example? It would solve some of the knottiest problems of his science, better than all the obscure disquisitions that the aboriginal population of Greece and Italy has given rise to. American ethnologists, accordingly, have not failed to appreciate the value of such iconographic evidence relative to the ante-historical population of their own continent; and have turned it to even more account than legitimate inductive reasoning will sustain, in support of their favourite argument for the indigenous unity of the whole ancient and modern aborigines of the New World. The facts, however, are independent of all such

deductions, and are deserving of the minutest and most impartial consideration.

It is, indeed, in these two respects, as records, first, of the physical characteristics of the Mound-Builders and the contemporary tribes or nations known to them; and secondly, of the fauna, native, and foreign to the country occupied by them, with which they were familiar, that the mound sculptures are chiefly to be valued. After an opportunity of carefully inspecting the originals, now in the collection of Dr. E. H. Davis of New York, I cannot avoid the conclusion that their artistic merits have been somewhat overrated. The accuracy with which some of the objects of natural history are copied in every minute detail is indeed remarkable; yet it is only a stage in advance of the imitative faculty so strikingly apparent in similar, though inferior specimens of modern Indian sculpture. Were those miniature works of art the sole memorials of the Mound-Builders, there would be no reason for regarding them as other than ancestors of the forest tribes, among whom the artistic faculty had been developed, in all probability, along with other corresponding elements of incipient civilisation. But, as we have already seen, the evidence by which both their civilisation and their essential difference are demonstrated, rests on independent grounds, and would be slightly affected by the absence of this interesting but wholly subsidiary class of illustrations.

In one of the smaller mounds of the remarkable group already referred to, within the sacred enclosure on the west bank of the Scioto River, called "Mound City," discoveries were made of a varied and singularly interesting nature, which are thus described by the explorers: "Intermixed with much ashes, were found, not far from two hundred pipes carved in stone, many pearls and

shell-beads, numerous disks, tubes, etc., of copper, and a number of other ornaments of copper covered with silver, etc. etc. The pipes were much broken up, some of them calcined by the heat, which had been sufficiently strong to melt copper; masses of which were fused together in the centre of the basin. A large number have, nevertheless, been restored at the expense of much labour and no small amount of patience. They are mostly composed of a red porphyritic stone, somewhat resembling the pipe-stone of the *Coteau des Prairies*, excepting that it is of great hardness, and interspersed with small, various-coloured granules. The fragments of this material which had been most exposed to the heat were changed to a brilliant black colour resembling Egyptian marble. Nearly all the articles carved in limestone, of which there had been a number, were calcined. The bowls of most of the pipes are carved in miniature figures of animals, birds, reptiles, etc. All of them are executed with strict fidelity to nature, and with exquisite skill. . . . . But the most interesting and valuable in the list are a number of sculptured human heads, no doubt faithfully representing the predominant physical features of the ancient people by whom they were made. We have this assurance in the minute accuracy of the other sculptures of the same date."[1]

Of these invaluable examples of ancient American iconography, one (Fig. 19.) has attracted special attention, not only as the most beautiful head of the series, but from its supposed correspondence to the type of the modern North American Indian. "The workmanship of this head," Messrs. Squier and Davis remark, "is unsurpassed by any specimen of ancient American art which has fallen under the notice of the authors, not

[1] *Ancient Monuments of the Mississippi Valley*, p. 152.

excepting the best productions of Mexico and Peru."[1] In the well-executed illustration which accompanies these remarks, the Red Indian features are unmistakably represented; nor has this failed to receive abundant attention, and to have ascribed to it even more than its due importance. Mr. Francis Pulszky, the learned Hungarian, thus comments on it in his *Iconographic Researches on Human Races and their Art*:—"A most

FIG. 19.—Portrait Mound Pipe.

characteristic, we may say artistically beautiful head, the workmanship of these unknown Mound-Builders, dug up and published by Squier, exhibits the peculiar Indian features so faithfully, and with such sculptural perfection, that we cannot withhold our admiration from their artistical proficiency. It proves three things: 1st, That these Mound-Builders were American Indian in Type; 2d, That time (age ante-Columbian, but otherwise unknown) has not changed the type of this indigenous group of races; and 3d, That the Mound-Builders were probably acquainted with no other men but themselves."[2] Such are the sweeping deductions drawn from the premises supplied by a single example of mound-sculpture: or rather from the depiction of it in

[1] *Ancient Monuments of the Mississippi Valley*, p. 245, fig. 145.

[2] *Indigenous Races of the Earth*, p. 183.

Messrs. Squier and Davis's volume; for after a careful examination of the original, its ethnic characteristics appear to me to be misrepresented in the illustration referred to. The artist has, no doubt undesignedly, given to his drawing much more of the typical Indian features than are traceable in the original. The nose, instead of having the salient Roman arch there represented, is perfectly straight, as shown in the profile here

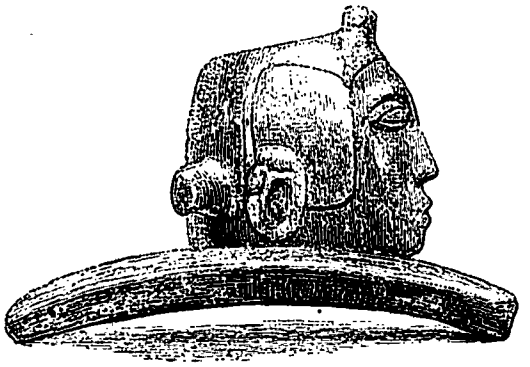


Fig. 20.—Portrait Mound Pipe.

given (Fig. 20.), and is neither very prominent nor dilated.

The mouth, though protuberant, is small; and instead of the characteristic ponderous maxillary region of the true Indian, the chin and the upper lip are both short; and the lower jaw, without any marked width between the condyles, is small, and tapers gradually towards the chin. Perhaps it is owing to this smallness of the lower portion of the head and face, that it was supposed to represent a female. But such an idea is not suggested by any marked characteristic either in the features or head-dress. The cheek-bones, though high, are by no means so prominent as in the engraving. Indeed, the projection is almost entirely in front, giving a protuberant cheek immediately under the eye. I doubt if any impartial observer, familiar with Indian physio-

gnomy, would assign this head to the same type, if shown to him without any knowledge of its history.[1]

It is apparent, therefore, that the inferences drawn from the representation of a single example of mound-sculpture, are open to question on account of the inaccuracy of the premises. But even supposing the head to be as represented in the engraving in the *Monuments of the Mississippi Valley*, or to reproduce, beyond all doubt, the features of the modern American Indian; it would by no means prove the three propositions deduced from its discovery: since it is not the only example of sculptured portraiture discovered in the mounds, and we look in vain in other examples for those points of Indian physiognomy which would first attract the eye of the imitative modeller or sculptor. The salient and dilated nose, the prominent cheek-bones, the massive jaw, and large mouth, may be assigned as the most noticeable characteristics; but all or nearly all of them are wanting in most of the other sculptured heads or masks from the mounds. The character of these may be seen in the head engraved here (Fig. 21), derived from the same rich depository opened in "Mound City." It is cut in a compact yellowish stone. The nose is nearly

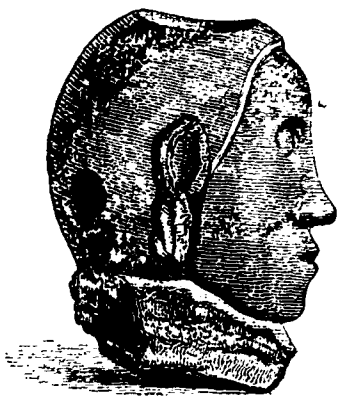


FIG. 21.—Portrait Mound Pipe.

[1] This head has already been made the basis of such sweeping generalizations that the accuracy of its description and representation becomes of great importance. Through the kindness of Dr. Davis, I have not only had opportunities of carefully examining the original; but I possess a cast of it, from which the drawings have been made, and subsequently compared with the original. A comparison of Fig. 19 with the corresponding view of the same object, as figured in Vol. I. of the *Smithsonian Contributions to Knowledge*, will show how much the American Indian characteristics of the latter are due to the pencil of the modern draughtsman.

in a line with the forehead, excepting at the point, which projects in a manner certainly by no means characteristic of Indian features; and though the lips protrude, as in the previous head, they are delicate, and the mouth is small. The ears in both are large, and in the latter are perforated with four small holes around their upper edges. In this case, from the delicacy of the features, it is suggested with greater probability than in the former example, that it was designed after a female model. Another example engraved in the *Ancient Monuments of the Mississippi Valley* (No. 143) is executed in the same material, but much altered by fire. It has not, like the previous examples, been designed for a pipe-head, but is broken off from a complete human figure, or other larger piece of carving. It is much inferior as a work of art, and indeed approaches the grotesque or caricature. Nevertheless, it has considerable character in its expression; and no one familiar with the Indian cast of countenance would readily assign either to it or the previous specimen of mound-sculpture any aim at such representation, if unaware of the circumstances of their discovery. In this, as in others of the heads, the face is tattooed, and the ears have been perforated; and from the strongly attached oxide of copper at those points, there can be little doubt they were decorated with rings or pendants of that metal; but the action of the sacrificial fires has only left an uncertain trace of the character of such ancient modes of personal adornment. Various other portrait-sculptures and terra-cottas, either found in the mounds, or discovered within the region where they chiefly abound, are figured in the works of Squier, Schoolcraft, and others, and in the American Ethnological Society's Transactions. The majority of them are inferior to those already described, as works of art. But if they possess any value as indi-

cations of the physiognomical type of ancient American races, they tend to confirm the idea of a prevailing diversity, instead of a uniformity of cranial form and features.

From the examples thus referred to, it is obvious that the discovery of a sculptured head of the most strongly marked Indian features, among so many of a different type, in the mounds of the Mississippi Valley, would only correspond with another interesting fact, that animals foreign to the region, and even to the North American continent, are found figured in the mound-sculptures. It presents a parallel to well-known examples of Etruscan vases, moulded in the form of negros' heads; and of Greek pottery, painted with the characteristic negro features and woolly hair. Specimens of both are preserved among the collections of the British Museum, and furnish interesting evidence, alike of the permanency of the negro type, and of the familiarity both of Greek and Etruscan artists with the African features, long prior to the Christian era. Similar examples of foreign portraiture have attracted attention, on the still older monuments of Egypt, and among the basso-relievos of the tomb of Darius Hystaspes at Persepolis: supplying varied and interesting illustrations of imitative art employed in the perpetuation of ethnic peculiarities of physiognomy. Supposing, therefore, the Mound-Builders to have been a settled semi-civilized population, as essentially distinct from a contemporaneous barbarous race, analogous to the living descendants of such among the Indian tribes of the North-west, as the classic nations of antiquity differed from the barbarian tribes beyond the Rhine and the Baltic: it is no more surprising to trace the genuine Indian features depicted in the mound-sculptures, than to discover those of the Dacian or the Gaul on the column of Trajan. It proves that the

Mound-Builders were familiar with the American Indian type, but nothing more. The evidence indeed tends very distinctly to suggest the idea that they were not of the same type; since the majority of sculptured human heads hitherto recovered from their ancient depositories do not reproduce the Indian features.

The physical type of the Mound-Builders will again come under consideration in a subsequent chapter; but it is interesting meanwhile to observe that even in the style and art-characteristics of this portrait-sculpture, there are traces of peculiar and distinctive qualities. The imitative art still manifests itself in varied and expressive varieties of style, in the works of the rude Indians: some tribes, such as the Algonquins, confining themselves to literal reproductions of natural objects, while others, such as the Babeens, indulge in a grotesque and ingeniously diversified play of fancy. But the intellectual development implied in individual portraiture goes far beyond this, and is rare indeed among nations considerably advanced in the earlier stages of civilisation. Even among the civilized Mexicans, the imitation of the human face and figure does not appear to have advanced beyond the grotesque; and although the sculptors of Central America and Yucatan manifested all the fine artistic power which accords with the civilisation of a lettered people, yet in the majority of their statues and reliefs, we see the subordination of the human form and features to the crude symbolism of their mythology, or the mere ornamental requirements of decorative art. The peculiar characteristics of native American art attracted at an early period the notice of the Spanish colonists, though unfortunately for us, their superstitious bigotry led in many cases to the destruction of its most interesting and valuable examples. The following curious criticism on the sculptures of the pagan Mexicans, from

the pen of Torquemada, is not the less valuable from the trait of Franciscan prejudice which tinges all the reflections and narrations of his *Indian Monarchy*:—"It appears," he says, "as if God permitted that the figures of their idols should be the hideous semblances of their own souls; nor was it till after they had been converted to the Christian faith that they were ever able to model the figure of a man."[1] Again, the ingenious and learned Hungarian, Francis Pulszky, after comparing Indian, Mexican, Peruvian, and Central American works of art, remarks: "The hunter tribes of America evince no feeling for plastic beauty. Yet withal, like the Turks and the Celts, they have a considerable talent for decorative designs, and some perceptions of the harmony of colours. The originality and ornamental combination of their bead-work and embroidery are sufficiently known, but they always fail in rendering the human form. Far higher was the civilisation of that race which preceded them in the trans-Alleghanian States."[2] It thus seems that, amid the general prevalence of a peculiar aptitude for imitative art, alike among the ancient and modern nations of the American continent, the Mound-Builders, though confining their art, so far as we can now judge, within a narrow range, developed a power of appreciating the minuter delicacies of plastic truth and beauty, such as is only traceable elsewhere among the choicest productions of the sculptors of Uxmal and Palenque.

To the fruits of this cultivated imitative skill we owe, in like manner, another class of sculptures which have an important significance in relation to the ethnological problems affecting the ancient and ante-Columbian population of the New World. In describing the remarkable

[1] *Monarchia Indiana*, B. XIII. c. 34.

[2] *Iconographic Researches; Indigenous Races*, p. 182.

deposit of specimens of miniature sculpture, including examples of human portraiture found on the altars of one of the sacrificial mounds in the Scioto Valley, reference has already been made to the curious collection of stone pipes found there, with the bowls of most of them carved into figures of beasts, birds, and reptiles: all, as described by their intelligent discoverers, executed with striking fidelity to nature. On these representations of objects of natural history, indeed, along with those of the human head and figure, the ancient sculptors appear to have lavished their artistic skill, with a degree of care and ingenuity bestowed on none other of the less perishable works, from which alone we can now judge of their intellectual development, or the progress they had attained in the arts of civilisation. "Not only," as Messrs. Squier and Davis observe, "are the features of the various objects represented faithfully, but their peculiarities and habits are in some degree exhibited. The otter is shown in a characteristic attitude, holding a fish in his mouth; the heron also holds a fish; and the hawk grasps a small bird in its talons, which it tears with its beak. The panther, the bear, the wolf, the beaver, the otter, the squirrel, the racoon, the hawk, the heron, crow, swallow, buzzard, the paroquet, toucan, and other indigenous and southern birds; the turtle, the frog, toad, rattlesnake, etc., are recognised at first glance."[1] To this comprehensive list, Mr. Squier makes further additions in a work of later date. Contrasting the truthfulness of the carvings from the mounds with the monstrosities or caricatures of nature usually produced by the savage sculptor, he remarks: "They display not only the general form and features of the objects sought to be represented, but to a surprising degree their characteristic expression and attitude. In some instances their very habits are

[1] *Ancient Monuments of the Mississippi Valley*, p. 152.

indicated. Hardly a beast, bird, or reptile, indigenous to the country, is omitted from the list;" and in addition to those named above, he specifies the elk, the opossum, the owl, vulture, raven, duck, and goose, and also the alligator.[1] In describing specific examples, the authors remark in reference to one pipe-head carved in the shape of a toad: the knotted, corrugated skin is well represented, and the sculpture is so very truthful, that if placed in the grass before an unsuspecting observer, it would probably be mistaken for the natural object; and they further add: "those who deem expression in sculpture the grand essential, will find something to amuse as well as to admire, in the lugubrious expression of the mouths of these specimens of the toad." In so far as these miniature works of art represent indigenous fauna, they are chiefly remarkable for the evidence they furnish, not only of an imitative talent of a high order, but of a command of the individual phases of character and expression truly artistic. The wild cat, for example, is figured in a variety of characteristic attitudes, and with a corresponding acuteness of expression, worthy of Audubon.

Various spirited examples of such sculptures are in the collection of Dr. Davis, and drawings of some of them have been given in the Smithsonian volume, to which he so largely contributed. One of those from "Mound City," a highly expressive head, differing from other examples, bears a close resemblance to that of the cougar. The sculptures of birds are much more numerous than those of beasts, and comprise between thirty and forty different kinds, of which nearly one hundred specimens have been found. Of these the explorers observe: "We recognise the eagle, hawk, heron, owl, buzzard, toucan (?), raven, swallow, paroquet, duck, grouse, and numerous

[1] *Antiquities of the State of New York*, p. 338.

other land and water birds. There are several varieties of the same species; for instance, among the owls, we find the great owl, the horned owl, and the little owl; there are also several varieties of the rapacious birds." Of one example, it is remarked, "the engraving in point of spirit falls far short of the original." The writers further observe: "It will be readily recognised as the tufted heron, the most indefatigable and voracious of all the fisher varieties. The small body, long wings, extending to the extremity of the short tail, long thin neck, sharp bill, and tufted head, are unmistakable features. He is represented in the attitude of striking a fish, which is also faithfully executed. Nothing can surpass the truthfulness and delicacy of the sculpture. The minutest features are shown; the articulations of the legs of the bird, as also the gills, fins, and scales of the fish, are represented. It is carved from the red, speckled porphyry, already several times mentioned as constituting the material of many of these sculptures. As a work of art it is incomparably superior to any remains of the existing tribes of Indians."[1] Around one pipe-bowl a rattlesnake is coiled; other representations of various serpents have been found, coiled in like manner round the bowls of stone pipes. One represents a variety now unknown, or not hitherto described. It has a broad, flat head, and the body is singularly marked. The ingenuity and fancy of the ancient sculptors are also displayed in miniature carvings, executed seemingly, like the sportive sketches of the modern artist, with no other object than their own gratification. The head of a goose, for example, is cut in a hard, black stone, three and a half inches long, and with a human skull or "death's-head" carved on the back of it. Unfinished carvings have also been found, showing in some degree the process by which they were

[1] *Ancient Monuments of the Mississippi Valley*, p. 259.

wrought. A toad, in a characteristic attitude, but only roughly shaped out, "very well exhibits the mode of workmanship. While the general surface appears covered with striæ running in every direction, as if produced by rubbing, the folds and lines are clearly *cut* with some sort of graver. The marks of the implement, *chipping out* portions a fourth of an inch in length, are too distinct to admit the slightest doubt that a cutting tool was used in the work." Again, it is remarked of another pipe-head, blocked out into the form of a bird: "This specimen is unfinished, and plainly exhibits the process adopted by the ancient artist in bringing it to its present state. None of the more minute details have as yet received any attention. The base and various parts of the figure exhibit fine striæ, resulting from rubbing or grinding; but the general outline seems to have been secured by cutting with some sharp instrument, the marks of which are plainly to be seen, especially at the parts where it would be difficult or impracticable to approach with a triturating substance. The lines indicating the feathers, grooves of the beak, and other more delicate features, are cut or graved on the surface at a single stroke. Some pointed tool appears to have been used, and the marks are visible where it has occasionally slipped beyond the control of the engraver. Indeed, the whole appearance of the specimen indicates that the work was done rapidly by an experienced hand, and that the various parts were brought forward simultaneously. The freedom of the strokes could only result from long practice; and we may infer that the manufacture of pipes had a distinct place in the industrial organization of the Mound-Builders." But this, though full of interest, need not surprise us, since it is undoubted that the art of the arrow-maker, which required both skill and experience, was pursued among the forest-tribes as a

special craft; nor is, even now, that of the pipe-maker wholly abandoned.

So far, therefore, we are enabled to lift the curtain, and look back into that remote past. We see the industrious sculptor at his task; and holding silent converse with him over his favourite works, we learn somewhat of his own physical aspect, of the range of his geographical experience and knowledge, and form our judgment of his mental capacity and intellectual development: even as we do of a Benvenuto Cellini, by the examination of some of the exquisite productions of his art, and the perusal of the lively chroniclings of his graphic autobiography. The pottery of the mounds, in like manner, adds to our knowledge of the art and civilisation of the ages in which it was produced. But, next in importance to the evidence thus furnished of the physical characteristics of the ancient race, the miniature sculptures of the Scioto mounds derive their chief value from the indications they supply of the extent and nature of the geographical relations of the remarkable people by whom they were executed; whatever may be the theory finally accepted as that which may most satisfactorily account for the facts thus brought to light. By such specimens of imitative skill we learn psychological facts concerning the ancient population of America, not without their importance in the history of its incipient civilisation, or the discussion of some of its more obscure ethnological problems. But these ingenious products of the ancient sculptor's studio have a still more important significance in relation to those inquiries which embrace the migrations of aboriginal races. By the fidelity of the representations of so great a variety of subjects copied from animal life, they furnish evidence of a knowledge in the Mississippi Valley, of the fauna peculiar not only to southern but to tropical latitudes,

extending beyond the Isthmus into the southern continent; and suggestive either of arts derived from a foreign source, and of an intimate intercourse maintained with the central regions where the civilisation of ancient America attained its highest development: or else indicative of migration, and an intrusion into the northern continent, of the race of the ancient graves of Central and Southern America, bringing with them the arts of the tropics, and models derived from the animals familiar to their fathers in the parent-land of the race.

Of one of the most interesting of these exotic models, the *Lamantin* or *Manatee,* seven sculptured figures have

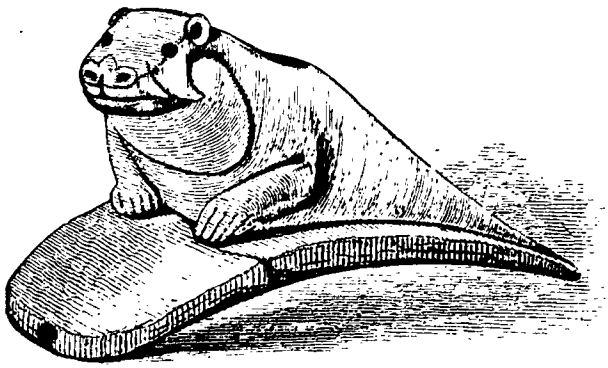


FIG. 22.—Manatee, Pipe-Sculpture.

been taken from the mounds of Ohio. This phytophagous cetacean, which, when full grown, measures from fifteen to twenty feet in length, is found only in tropical waters. Species haunt the estuaries and large rivers of Central and intertropical South America; as also those of both the eastern and western sides of tropical Africa: and sometimes ascend the rivers to a great distance from the sea. Examples were seen by Humboldt in the Rio Meta, a branch of the Orinoco, one thousand miles above its mouth. They are also found among the Antilles, and on the coast of the Florida peninsula. All the noted external details of the manatee are faithfully and mi-

nutely reproduced in the sculptures from the mounds. The most remarkable feature is the external fore-paw, occupying the usual place of the cetacean fin, and which, from its supposed resemblance to a hand, led the Spaniards to give it the name of Manati. To the earliest European voyagers, fancy helped to exaggerate the peculiar novelty of this strange animal, and it received from them the name of the Siren. The flesh of the manatee is extensively used among the inhabitants of St. Christopher's, Guadaloupe, and Martinique; and in Southern America it is in great request during Lent, as its flesh supplies a savoury substitute for the prohibited animal food of that season: the manatee being classed, according to the system of ecclesiastical natural history, among fishes. The form, therefore, of this animal must be familiar to the Indians of South America, and was once equally well known to the natives of the Antilles, and probably to the ancient coastmen of the Gulf. But we must account by other means for the discovery of accurate miniature representations of it among the sculptures of the far-inland mounds of Ohio; and the same remark equally applies to the jaguar or panther, the cougar, the toucan; to the buzzard, possibly, and also to the paroquet. The majority of these animals are not known in the United States; some of them are totally unknown within any part of the North American continent. Others may be classed with the paroquet, which, though essentially a southern bird, and common in the Gulf, does occasionally make its appearance inland; and might possibly become known to the untravelled Mound-Builder, among the fauna of his own northern home.

The importance of such evidences of a knowledge of tropical animals, and even of those now confined exclusively to the southern continent, possessed by the ancient dwellers in the Scioto Valley, has not escaped the notice

of the intelligent explorers of the mounds. It has even induced them, with becoming caution, to hesitate in assigning with absolute certainty, the name of the toucan to sculptures, concerning the aim of which there could be no other reasonable ground for doubt. On this subject, accordingly, they remark, in special reference to the manatee sculptures: "These singular relics have a direct bearing upon some of the questions connected with the origin of the mounds. That we find marine shells or articles composed from them, in the mounds, is not so much a matter of surprise, when we reflect that a sort of exchange was carried on even by the unsympathizing American tribes, and that articles from the mouth of the Columbia are known to have found their way, by a system of transfer, to the banks of the Mississippi; their occurrence does not necessarily establish anything more, than that an intercourse of some kind was kept up between the builders of the mounds on the banks of the Ohio and the sea. There is, however, something more involved in the discovery of those relics. They are undistinguishable, so far as material and workmanship are concerned, from an entire class of remains found in the mounds, and are evidently the work of the same hands with the other effigies of beasts and birds; and yet they faithfully represent animals found (and only in small numbers) a thousand miles distant upon the shores of Florida, or—if the birds seemingly belonging to the zygodactylous order be really designed to represent the toucan,—found only in the tropical regions of South America. Either the same race, possessing throughout a like style of workmanship, and deriving their materials from a common source, existed contemporaneously over the whole range of intervening territory, and maintained a constant intercommunication; or else there was at some period a migration from the south, bringing with it

characteristic remains of the land from which it emanated. The sculptures of the manatees are too exact to have been the production of those who were not well acquainted with the animal and its habits." Of the representations of the toucan, the accompanying woodcut (Fig. 23) will furnish a sufficient illustration. It is imitated with considerable accuracy, though inferior to some of the finer specimens of mound-sculpture. The most important deviation from correctness of detail is, that it has three toes instead of two before, although the two are correctly represented behind. It is also figured stooping its head to take food from a human hand; and

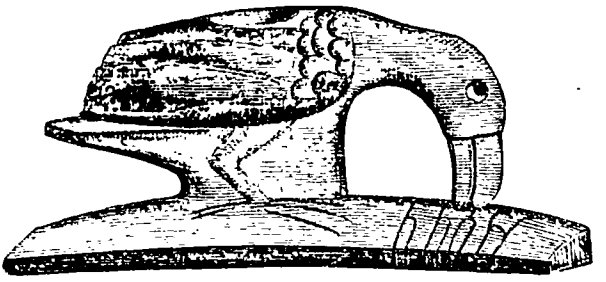


FIG. 23.—Toucan, Pipe-Sculpture.

as it is known that the brilliant plumage of the toucan leads to its being prized, and frequently tamed by the natives of Guiana and Brazil, this tends not only to confirm the idea of the sculptures in question being representations of the toucans of the southern continent; but to suggest that the Mound-Builders may have had their aviaries, like those in which the Aztec monarchs assembled birds of splendid plumage and beautiful form from every part of the Mexican empire.

The questions, then, submitted here for our consideration, as legitimate deductions from such archæological evidence, are these:—Was the whole geographical area, indicated by such a fauna, occupied contemporaneously, in those ages when the altars of the Ohio mounds still blazed with sacrificial fires, by a common race, maintain-

ing constant intercourse and commercial relations, for the interchange of manufactures and commodities?—or must we recognise in such evidences of a familiarity with the natural history of the tropics, and even of the southern continent of America, a proof that that very people, who derived all their metal from the great northern regions of Lake Superior, had themselves emigrated from southern latitudes no less rich in metallic ores?

That such a migration, rather than a contemporaneous existence of the same race over the whole area thus indicated, and maintaining intimate intercommunication and commercial intercourse, is the more probable inference, is suggested on various grounds. If the Mound-Builders had some of the arts and models, not only of Central but also of Southern America, and perhaps of Peru: we have seen that they also employed in their ingenious manufactures the gigantic tropical shells of the Gulf of Mexico; mica believed to have been brought from the Alleghanies; and the copper, and probably the silver of Ontonagon and the Keweenaw peninsula. The fact indeed that among the specimens of their most elaborate carving, some of the objects represent birds and quadrupeds belonging to latitudes so far to the south, naturally tends to suggest the idea of a central region where arts were cultivated to an extent unknown in the Mississippi Valley; and that those objects, manufactured in the localities where such models are furnished by the native fauna, remain only as the evidences of ancient commercial relations maintained between these latitudes and the localities where now alone such are known to abound. But in opposition to this, full value must be given to the fact that neither the relics, nor the customs which they indicate, appear to pertain exclusively to southern latitudes; nor are such found to predominate among the singular evidences of ancient and more matured civilisa-

tion either in Central or Southern America; while the varied nature of the materials employed in the arts of the Mound-Builders, indicate a very wide range of relations; though it cannot be assumed that these were maintained in every case by direct intercourse.

The earlier students of American archæology, like the older Celtic antiquaries of Britain, gave full scope to a system of theorizing which built up comprehensive ethnological schemes on the very smallest premises; but in the more judicious caution of later writers there is a tendency to run to the opposite extreme. Perhaps Messrs. Squier and Davis indulge at times in an exaggerated estimate of the merits of the remarkable works of art discovered and published as the result of their joint labours; but subsequent critics have either unduly depreciated them, or solved the difficulties attendant on such remarkable discoveries, by ascribing their manufacture to an undetermined foreign source; as though the mere transference of their origin to some unknown people, in a locality equally vague and undefined, could tend in any satisfactory degree to account for the ingenious skill of their ancient American artists. Mr. Schoolcraft certainly manifests a disposition to underrate the artistic ability unmistakably discernible in some of the works of the Mound-Builders; while Mr. Haven, who fully admits their skilful execution, derives from that very fact the evidence of their foreign manufacture. After describing the weapons, pottery, and personal ornaments obtained from the mounds, the latter writer adds, "and, with these were found sculptured figures of animals and the human head, in the form of pipes, wrought with great delicacy and spirit from some of the hardest stones. The last-named are relics that imply a very considerable degree of art, and if believed to be the work of the people with whose remains they are found, would tend greatly to increase the wonder that the art of sculpture among

them was not manifested in other objects and places. The fact that nearly all the finer specimens of workmanship represent birds, or land and marine animals belonging to a different latitude; while the pearls, the knives of obsidian, the marine shells, and the copper equally testify to a distant, though not extra-continental origin, may, however, exclude these from being received as proofs of local industry and skill." But a reconsideration of the list already given of animals sculptured by the ancient pipe-makers of the mounds, cannot fail to satisfy the inquirer that it is quite an over-statement of the case to say that nearly all belong to a different latitude. The real interest and difficulty of the question lies in the fact of discovering, along with so many spirited sculptures of animals pertaining to the locality, others represented with equal spirit and fidelity, though belonging to diverse latitudes. To those who are familiar with early Scandinavian and British antiquities, such an assignment of all the sculptures of the mounds to a foreign origin, on account of their models being in part derived from distant sources, must appear to be a needless assumption which only shifts without lessening the difficulty. On the sculptured standing stones of Scotland—belonging apparently to the closing era of Paganism, and the first introduction of Christianity there,—may be seen the tiger or leopard, the ape, the camel, the serpent, and as supposed by some, the elephant and walrus, along with other representations or symbols, borrowed, not like the models of the Mound-Builders, from a locality so near as readily to admit of the theory of direct commercial intercourse, or recent migration, but some of them from remote districts of Asia, or from Africa. The most noticeable difference between the imitations of foreign fauna on the Scottish monuments, and in the ancient American sculptures, is that the former occasionally betray, as might be expected, the conventional characteristics of a traditional type;

while the latter, if they furnish evidence of migration, would in so far tend to prove it more recent, and to a locality not so distant as to preclude all renewal of intercourse with the ancestral birth-land. But traces of the same reproduction of unfamiliar objects are apparent in the mound sculptures. The objects least truthfully represented, in some cases, are animals foreign to the region where alone such works of art have been found. But the South American toucan of the mound sculptor, figured on a previous page, is certainly not inferior to the accompanying specimens of the Peruvian modeller's imitative skill, wrought on a vessel of black ware (Fig. 24), now in the collection of the Society of Antiquaries

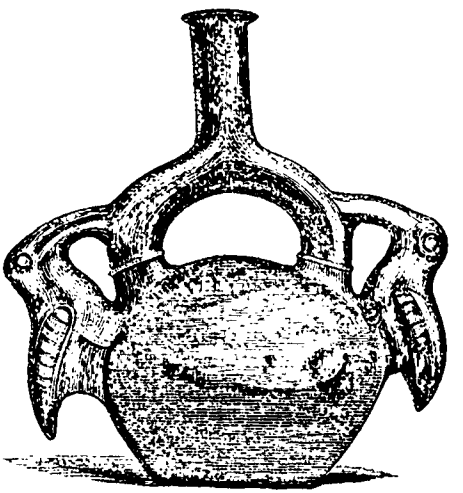


Fig. 24.—Peruvian Black Ware.

of Scotland; though it will be remembered that the latter are the work of an artist to whom the original may be presumed to have been familiar. Notwithstanding the great spirit displayed in many of those miniature sculptures, the difference in point of fidelity of imitation between them and the carvings of foreign subjects on the Scottish standing-stones, is not so great as the descriptions of American archæologists would suggest; while both are alike accompanied by the representations of monstrosities or ideal creations of the

fancy, which abundantly prove that the ancient sculptors could work without a model. Some of the human heads of the American sculptures, for example, if regarded as portraits, must be supposed to be designed in the style of *Punch!* and several of the animals engraved in the *Ancient Monuments of the Mississippi Valley* fall far short of the fidelity of imitation ascribed to them in the accompanying text. But after making every requisite deduction, there are still sufficiently remarkable evidences of imitative skill and artistic ingenuity to justify the wonder, that a people capable of such beautiful miniature sculpture, should have left no larger monuments of their art. Whilst, however, we cannot recognise in this any sufficient ground for transferring their origin to a foreign locality, we may still look for analogies among the works of art in the different centres of native American civilisation. Works precisely similar to the mound sculptures do not occur, except in one or two stray specimens, in any other locality; but a curious class of stone relics found in Peru present a resemblance to the sculptured mound-pipes too striking to be

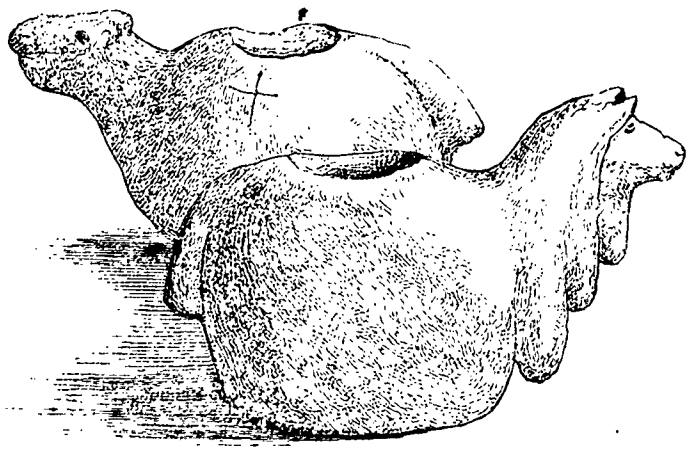


FIG. 25.—Peruvian Stone Mortars.

overlooked. Of the two examples given here (Fig. 25), the one is a llama, brought from Huarmachaco, in Peru, and now in the collection of the Historical Society of

New York. It is cut in a close-grained black stone, and measures four inches long. The other, which is somewhat smaller, and of darkish brown schist, is from a drawing made by Mr. Thomas Ewbank, while in Peru. The greater number of those seen by him represent the llama and its congeners, the alpaca, guanoco, and vicuna. They are all hollowed precisely like the bowl of the sculptured mound-pipes, but they have no lateral perforation or mouth-piece. Their most probable use was as mortars in which the Peruvians were wont to rub the tobacco into powder, working it with the small pestle until it became heated with the friction, when it was taken as snuff. The transition from this practice to that of inhaling the burning fumes seems equally simple and natural; and the correspondence between the ancient Peruvian tobacco-mortar and the stone pipe of the Mound-Builder is well worthy of note, when taken into consideration along with the imitations of birds of the southern continent found among the sculptures of the northern mounds. Dr. Tschudi describes four of these Peruvian relics preserved at Vienna, carved in porphyry, basalt, and granite; and he adds: "How the ancient Peruvians, without the aid of iron tools, were able to carve stone so beautifully, is inconceivable."

A further reason than any heretofore noticed, tends to give additional interest to the absence of any but the miniature carvings in the northern mounds. Idolatry, in its most striking, and also in some of its most barbarous forms, prevailed, as we know, among the nations of the Mexican Valley, at the period of the Conquest. The monuments of Yucatan and Central America also leave no room to doubt that the worship of such visible impersonations of Divine attributes as their sculptors could devise, formed a prominent part of their religious services. Reference has also been made in a previous

chapter to rudely modelled and sculptured idols, accompanying numerous other ancient remains, in sepulchral deposits in Tennessee. Others have also been found in the Huacals of Chiniqui, on the Isthmus of Panama, along with numerous gold relics, and many fine specimens of pottery. But it is a singular fact that, amid so many traces of imitative sculpture, no relics obviously designed as idols, or objects of worship, have been dug up in the mounds, or found in such circumstances as to connect them with the religious practices of the Mound-Builders. The remarkable characteristics of their elaborately sculptured pipes, and their obvious connexion with services accompanying some of the rites of sacrifice or cremation, tend, however, to suggest very different associations with the pipe of those ancient centuries from such as now pertain to its familiar descendant. Embodying, as these highly-finished implements did, the result of so much labour, as well as of artistic skill: there are not wanting highly suggestive reasons for the opinion, that the elaborate employment of the imitative arts on the pipe-heads found deposited in the mounds, may indicate their having played an important part in the religious solemnities of the ancient race.

It is well worthy of note, in connexion with this, that various of the earlier writers on the customs of the American Indians, refer to expiatory sacrifices performed by them, which present some striking, though rude analogies, to the ancient offerings by fire on the mound-altars. Hearne describes a custom among the Chippewas, after the shedding of blood, of throwing all their ornaments, pipes, etc., into a common fire, kindled at some distance from their lodges; and Winslow narrates of the Nanohiggansets of New England, that they have a great house ordinarily resorted to by a few, whom he likens to priests; but he adds, "Thither, at certain times, resort all their people, and offer almost all the

riches they have to their gods, as kettles, skins, hatchets, beads, knives, etc., all which are cast by the priests into a great fire that they make in the midst of the house."[1] The analogies, however, which appear to be traceable in such practices of modern tribes remote from the localities of the old Mound-Builders, are after all slight, and may be accidental. They lack the most important elements which give their peculiar character to the ancient mound-altars, with their specific objects on each, their renewed foci, and the final inhumation of all under the elevated heap. It may be, rather, that in the strange mode of indulging in the favourite narcotic bestowed by America on the Old World, we have perpetuated into a common practice of mere sensual indulgence, what was once a solemn rite associated with the mysterious worship of the sacred enclosures and the altar-mounds of the Mississippi Valley. Nor is such an idea altogether devoid of illustration among the practices indulged in by the native Indian, in latitudes which we may associate with greater probability with the nativity of the Mound-Builders than the northern region of the Chippewas or that of the New England Nanohiggansets. Oviedo, who is our earliest authority, at least for any minute account of tobacco-smoking among the native tribes, speaks of it as an evil custom practised among the Indians of Hispaniola to produce insensibility; and greatly prized by the Carribees, who "called it *kohiba*, and imagined, when they were drunk with the fumes of it, the dreams they had were in some sort inspired."[2] Again, Girolamo Benzoni narrates, in his travels in America, recently translated from the edition of 1753 by Rear-Admiral Smyth: "In La Española, and the other islands, when their doctors wanted to cure a sick man, they went to the place where they were to ad-

[1] *Mass. Hist. Coll.*, Second Series, vol. ix. p. 94.

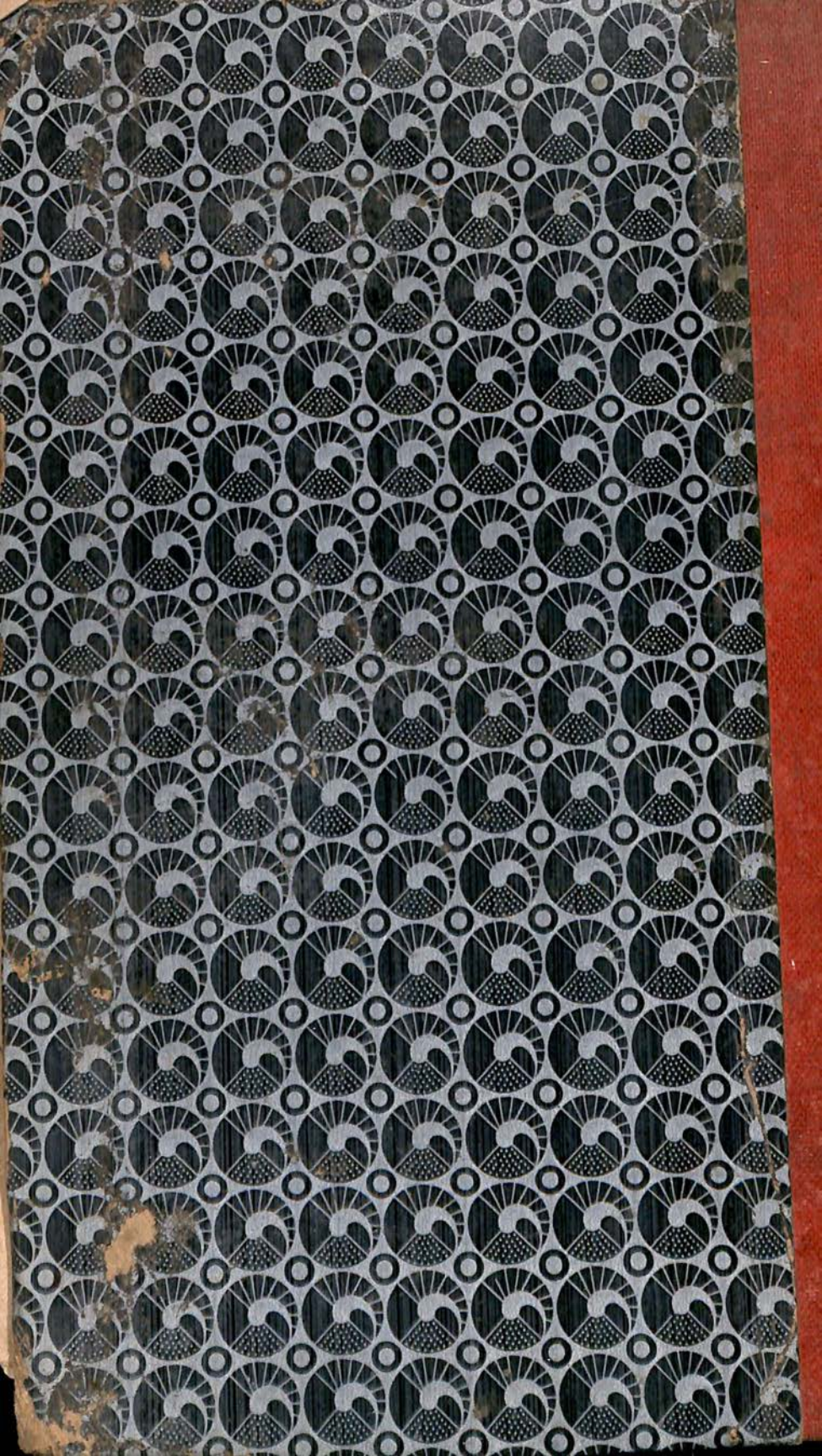
[2] *Historia General de las Indias*, second edit. p. 74.

minister the smoke, and when he was thoroughly intoxicated by it the cure was mostly effected. On returning to his senses, he told a thousand stories of his having been at the council of the gods, and other high visions."[1]

Many legends among the Indians ascribe a divine origin to tobacco. A chief of the Susquehanna Indians told of two hunters of the tribe sharing the venison they had cooked with a lovely squaw, who suddenly appeared to them; and on returning to the scene of their feast thirteen moons after, they found the tobacco-plant growing where she had sat. Harriot, who sailed in Sir Walter Raleigh's expedition of 1584, tells that the Indians of Virginia regarded tobacco as a means of peculiar enjoyment, in which the Great Spirit was wont freely to indulge, and that he bestowed it on them that they might share in his delights. Repeated allusions also refer to its intoxicating effects as an influence analogous to that which produced the visions and inspirations of the fasting dreams. It seems, therefore, by no means improbable, that the original practice of inhaling the fumes of tobacco was associated exclusively with superstitious rites and divination; so that the tobacco-plant may have played a part in the worship of the ancient Mound-Builders, analogous to that of the inspiring vapour over which the Delphic tripod was placed, when the priestess of Apollo prepared to give utterance to the divine oracles.

[1] *History of the New World.* By Girolamo Benzoni. Hakluyt Society, 1857.

END OF VOLUME FIRST.

00097373

Digitized with financial assistance from the
Government of Maharashtra
on 26 June, 2018